EDITORIAL STAFF

E. L. SHANER
Editor-in-Chief

E. C. KREUTZBERG
Editor

A. J. HAIN
Managing Editor

E. F. ROSS
Engineering Editor

GUY HUBBARD
Machine Tool Editor

D. S. CADOT
Art Editor

ASSOCIATE EDITORS

G. H. MANLOVE — J. D. KNOX
W. G. GUDE — G. W. BIRDSALL
W. J. CAMPBELL

New York
I. H. SUCH — B. K. PRICE
L. E. BROWNE

Pittsburgh — *Chicago*
R. L. HARTFORD — J. F. POWELL

Detroit — *Washington*
A. H. ALLEN — L. M. LAMM

London
VINCENT DELPORT

BUSINESS STAFF

G. O. HAYS
Business Manager

C. H. BAILEY
Advertising Service

New York . E. W. KREUTZBERG, B. C. SNELL
Pittsburgh . . . S. H. JASPER
Chicago . . . L. C. PELOTT, W. F. O'DELL
Cleveland . . . R. C. JAENKE, D. C. KIEFER

J. W. ZUBER
Circulation Manager

MAIN OFFICE

Penton Building, Cleveland

BRANCH OFFICES

New York . . . 110 East 42nd St.
Chicago . . Peoples Gas Building
Pittsburgh . 1800 Koppers Building
Detroit . . 1010 Stephenson Building
Washington . National Press Building
Cincinnati . . . 282 Sinton Hotel
San Francisco . . 2413 Milvia St.
Berkeley, Calif., Tel. Berk. 7354-W
London . . . . Caxton House, Westminster, S.W. 1
Berlin . Berlin, N.W. 40, Roonstrasse 10

• ● •

Published by THE PENTON PUBLISHING CO., Penton Building, Cleveland, Ohio. JOHN A. PENTON, Chairman of Board; E. L. SHANER, President and Treasurer; J. R. DAWLEY and G. O. HAYS, Vice Presidents; F. G. STEINEBACH, Secretary.

Member, Audit Bureau of Circulations; Associated Business Papers Inc., and National Publishers' Association.

Published every Monday. Subscription in the United States, Cuba, Mexico and Canada, one year $4, two years $6; European and foreign countries, one year $10. Single copies (current issues) 25c.

Entered as second class matter at the postoffice at Cleveland, under the Act of March 3, 1879.

Copyright 1939 by the Penton Publishing Co.

STEEL

ESTABLISHED 1882

Contents

Volume 104—No. 2 **January 9, 1939**

READER COMMENTS 7
AS THE EDITOR VIEWS THE NEWS 11
NEWS
- Surge of Rural Electrification Reflected in Metals and Equipment 13
- 1,500,000 Electric Refrigerators This Year 14
- Inland's New Blast Furnace Christened 15
- Steel Employment Rises in Numbers and Hours 16
- Meetings 16
- Claim $150,000,000 Backlog for Aircraft 17
- 1938 Pig Iron Output Smallest in Four Years 18
- Steelworks Operations for Week 19
- Ingots Only 56 Per Cent of 1937 Total 19
- Schneiders Cede Skoda to Czechs 23
- Men of Industry 28
- Obituaries 29
- November Steel Imports Up 9 Per Cent 30
- Republic Expands Gadsden Mills 31
- Sharp Gains in Ship Construction 31
- Activities of Steel Users and Makers 73
- Mineral Control World Peace Key 73

WINDOWS OF WASHINGTON 21
MIRRORS OF MOTORDOM 25
EDITORIAL—Needed: Business Men in Politics 32
THE BUSINESS TREND
- Activity Index Reflects Holiday Interruption 33
- Charts and Statistics 33-35

FORUM ON RE-EMPLOYMENT 36
TECHNICAL
- A Steam-Electric Locomotive 38
- Oxygen Lance Used To Drill Heavy Concrete 40

HEAT TREATING
- Annealing Stickers—Part I 41

MATERIALS HANDLING
- Crane Lubrication 43
- Special Truck Lifts Tote-Boxes 47

PROGRESS IN STEELMAKING
- Slab Turning 48
- Using Photoelectric Device To Control Open-Hearth Temperature 49

JOINING AND WELDING
- Saves 60 Per Cent 50

STAMPING
- Production Specials 53

INDUSTRIAL EQUIPMENT 56
MARKET REPORTS AND PRICES 59
- The Market Week 60

BEHIND THE SCENES 68
CONSTRUCTION AND ENTERPRISE 74
INDEX TO ADVERTISERS 80

PRODUCTION · PROCESSING · DISTRIBUTION · USE

"WE *Watch* COMPARATIVE MAINTENANCE COSTS...

...*and use* GULF'S *higher quality* LUBRICANTS to keep them down" SAY LEADING EXECUTIVES

"We DISTINGUISH CAREFULLY between LUBRICANTS costs and *LUBRICATION* costs," says this operating executive. "We bring comparative maintenance costs into the picture when we figure our *final* lubrication costs. If maintenance is low while production holds at a steady pace—or increases—we know our *real* lubrication costs are low, even though we've paid a few cents more per gallon for quality lubricants."

That far-sighted viewpoint is helping hundreds of plant men, from Maine to Texas, secure the economies management demands today in manufacturing costs. And it logically leads them to the use of Gulf's higher quality oils and greases. Plant operators find that when these better grades of lubricants are applied as recommended by an experienced Gulf engineer, production flows more smoothly, less time is lost for adjustments and repairs, and maintenance costs are lower. After Gulf quality lubricants have been placed in service, it is not uncommon for plant managers to report savings in maintenances alone amounting to many times the total monthly bill for lubricants!

So we suggest that you *watch comparative maintenance costs* from month to month in your plant, and ask a Gulf engineer to assist you in finding ways to effect savings through improved lubrication. He will work tactfully with your operating men—and they can benefit from his broad experience in the lubrication of machinery similar to yours. Gulf Oil Corporation—Gulf Refining Company, Gulf Building, Pittsburgh, Pennsylvania.

GULF INDUSTRIAL LUBRICATION

As the Editor Views the News

■ IN THE news of the past week perhaps nothing is more significant than the decision of the American Engineering council (p. 23) to undertake, at the expense of the National Industrial Conference board, a factual inquiry into the American patent system. Many economists have pointed to the patent situation as one of the causes of our economic difficulties and there has been much misunderstanding on the subject. Now that the patent situation is about to be dissected by the temporary national economic committee, great value should accrue from a factual analysis by a body so ably equipped for this work as the council. This undertaking is a fine example of the kind of organized effort which may be conducted by industry in order to safeguard the best interests of the country.

• • •

The business news continues cheerful. Steel production recouped the holiday loss, rebounding 11½ points (p. 19) to 51½ per cent of ingot capacity.

Operations Regain Loss

Operations of some companies now are materially above the pre-holiday rate. STEEL'S index of industrial activity (p. 33) stands at a much higher rate than a year ago. . . . Rural electrification represents a continually expanding market. American farms now are being electrified at the rate of about 200,000 a year, involving about 120,000 tons a year of steel and nonferrous metals in various fabricated forms (p. 13); producers of many diversified products are benefiting. . . . It is estimated (p. 14) that 1,500,000 electric refrigerators and 360,000 electric ranges will be sold in 1939, with current stocks of these products small.

Addressed by the President on the state of the union, the new congress (p. 21) applauded recommendations for improved national defense, but gave

Congress for Economy?

a cold ear to an appeal that government expenditures be maintained at the present level. Character of legislation to be enacted at this session remains to be determined. . . . The aviation industry (p. 17) is growing by leaps and bounds and will be increasingly a consumer of various materials and parts made by a large cross-section of industry. France contemplates the purchase of 1050 military planes in this country. . . . That rare event, the blowing in of a new blast furnace, was celebrated in traditional manner last week when Inland Steel Co. lighted its fifth and largest unit at Indiana Harbor.

• • •

The degree of prosperity of the farmer bears a relation to the level of industrial employment. A machine tool executive (p. 36), in discussing ways and

Would Begin With Farmer

means for increasing industrial employment, recommends a campaign to educate farmers in determining their costs; many farmers would ask higher prices for their products if they knew their true costs. . . .Unique development in railroad motive power is Union Pacific's new 5000-horsepower, steam-electric passenger locomotive (p. 38). It has automatic firing control, variable voltage acceleration and electric braking. It has top speed of 125 miles an hour and runs 700 miles between stops. . . . Hole for a 4-inch pipeline was drilled through a 7½-foot concrete wall (p. 40) with an oxygen lance.

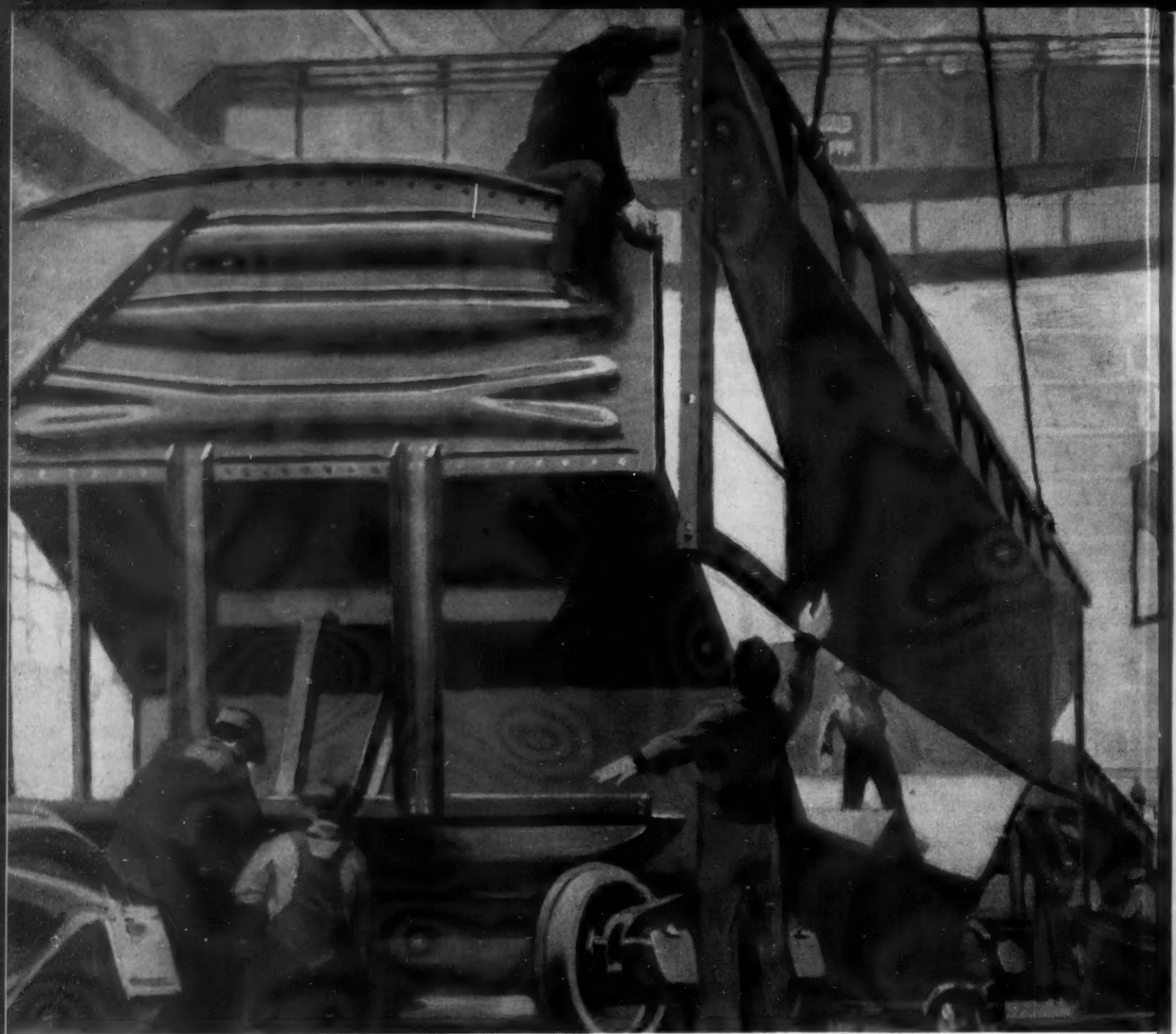
• • •

Carefully developed practice at continuous mills (p. 41) minimizes the problem of stickers that result from annealing. . . . Unfailing operation of substantially built materials handling

Handling Materials

equipment in steel mills depends largely on proper lubrication; a number of precautions (p. 43) must be observed. . . . Handling materials in the stockroom of a metalworking plant (p. 47) has been simplified by a special elevating truck that lifts loaded tote-boxes to racks. . . . Greater uniformity in open-hearth temperature is obtained by one steelmaker (p. 49) through use of an electric eye; roof life is increased by as much as 50 per cent. . . . By carefully adding to its line of products, a stampings manufacturer (p. 53) has been able to level off seasonal peaks and stabilize employment.

E C Kreutzberg



Prominent Railroad President Cites Advantages of High Tensile Steels

Comparing freight cars built of ordinary steel by a leading Railroad in 1928 with 1,000 new cars built by the same road in 1937, using high tensile low alloy steels, the President of the Railroad said:

"The new cars are stronger, possess greater durability and yet are 24% lighter per cu. ft. of carrying capacity than those built of ordinary steel 10 years ago."

We are proud of the fact that a large tonnage of Inland Hi-Steel was used in the construction of these new cars.

* * * * * * *

It is the purpose of Inland Hi-Steel to reduce weight without loss of structural strength . . . . to reduce the mileage cost of the waste load.

But there are also other important advantages in using Inland Hi-Steel. It has many times the corrosion resistance of ordinary steel—exceeds that of copper-bearing steel. It welds readily and is easily fabricated.

Inland engineers and metallurgists will welcome the opportunity of giving you full information about Inland Hi-Steel, and will gladly assist in its application to your products or equipment.

Write for Inland Hi-Steel Bulletin No. 10.

INLAND STEEL CO.

38 South Dearborn Street, CHICAGO • District Offices: DETROIT • KANSAS CITY • MILWAUKEE • ST. LOUIS • ST. PAUL

SHEETS STRIP TIN PLATE BARS PLATES FLOOR PLATES STRUCTURALS PILING RAILS TRACK ACCESSORIES REINFORCING BARS

Surge of Rural Electrification Reflected In Metals and Equipment

■ AMERICAN FARMS now are being electrified at the rate of about 200,000 a year—a far more rapid acceleration than was recorded in all the years prior to the depression.

In 1924 only 204,780 farms, as classified by the census bureau, were using electricity supplied by a central or commercial source.

By 1929 the number had more than doubled, to 576,168—still, however, representing a very small percentage of potential users.

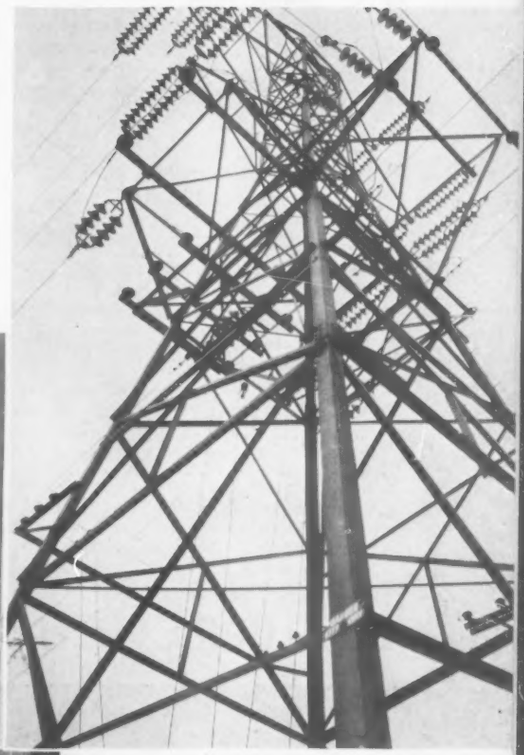
The depression slowed the movement, so that in 1933 there were only 4100 new installations. But notwithstanding the farmers' plight, the number has increased year by year, until at least 1,460,000 farms now have electricity supplied by commercial or government-sponsored companies.

Electrification means modernization on a large scale. About 5,000,000 farms still are without electricity, except for the comparatively few which operate their own generating sets. Millions are within the range of immediate commercial possibilities; millions more will not be reached with commercial power for generations to come; some will remain practically inaccessible.

What this great expansion means in terms of metals and manufacturing has been measured.

First, at the rate of 200,000 new users a year, some 66,000 miles of additional distributing lines are necessary annually. This alone requires 65,000 tons of steel and nonferrous metals for conductors, transformers and accessory hardware.

For each farm prosperous enough to install electric service there is a market for wiring materials and the equipment to use the electricity. On the basis of 200,000 new users a year, this figures up to 40,000 tons of metal. Added to this, new purchases annually by farms previously electrified account for 15,000 tons. The total is 120,000 tons of steel, copper, aluminum, and other metals annually. These figures have been established by trustworthy surveys.



■ **Not all pictures of farm life in these days are distressing. The spread of rural electrification alone means more comfort—and modern mechanical equipment—for many thousands**

Line building and equipment buying are facilitated by the rural electrification administration with loans to local non-profit co-operatives. This fiscal year REA will allot up to $140,000,000, with an additional $40,000,000 authorized for each of the next eight years.

It should not be inferred that private utilities are inactive in the

field; last year they built 60 per cent of new line mileage as against 40 per cent by REA groups.

Current consumption by farms has increased steadily to an annual average of more than 1000 kilowatt hours against 800 for urban users. Actually the only limit to electricity's application where current is available is the farmer's financial means. Literally hundreds of uses have already been found and more are being developed.

A national survey shows that the average farmer, incidental to electrification of his farm, and in the first year, spends $50 to $300 on wiring, requiring 100 pounds of metal, and buys electrical household equipment costing $180. Eventually his expenditures will match those of the line builders dollar for dollar.

Presented in the following table are itemized purchases made by 73 typical farms in this first year:

73 Wiring systems	$ 7,150
55 Hand irons	220
48 Ranges	5,700
48 Washers	2,400
44 Radios	2,200
33 Pressure pumps	1,980
23 Refrigerators	3,450
26 Cleaners	1,000
14 Water heaters	980
12 Toasters	40
8 Motors	320
8 Fans	50
7 Pump jacks	350
33 Miscellaneous items	360
Total	$26,200

Most urgent need, electric lighting of residence, barn and poultry houses, usually constitutes the first improvement. Farmers then buy electrically-driven water pumps, followed by various conveniences.

The importance of household equipment buying to metalworking industries is evident in the average steel weight of appliances: Electric refrigerator, 190 pounds; range, 190 pounds; washer, 57 pounds.

Numerous farm homes now are electrically heated and air conditioned. A recent development has been a tendency to air condition barns and poultry houses.

Time and labor are saved by using electric motors to drive equipment for grinding, hay loading, threshing, feed mixing, wood cutting and silo filling. Notable, also, is the installation of electric power tools in work shops and machine rooms.

Dairy farms offer an exceptionally promising market. Here electrical equipment is used for milking, cooling, sterilizing, feeding and even for heat treatment of stock.

Fruit growers, poultry men and truck farmers are building large electrically-refrigerated storage houses to preserve produce between harvesting and favorable marketing dates.

An experiment conducted by an equipment maker demonstrates what electricity can do for poultry farms. On this model "egg factory" in Pennsylvania, electricity wakes the chickens, feeds and waters them, provides light and fresh air, sorts their eggs and broods their chicks.

Electrically-heated brooders of galvanized steel are already in use on many poultry farms.

Hot-beds and electrical soil heating devices are operated successfully by large farm enterprises to hasten and control growth of certain valuable and perishable products.

Agricultural groups, power com-

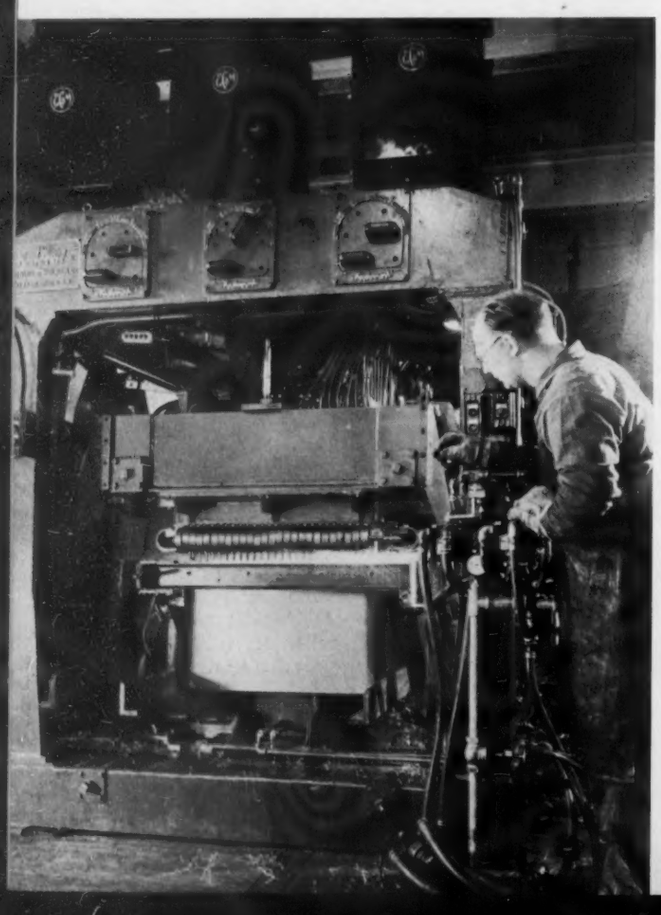
(*Please turn to Page* 74)

Steady Increase in Farms Using Electricity

	Number Added	End of Year
1924	27,219	204,780
1925	41,370	246,150
1926	62,975	309,125
1927	84,096	393,221
1928	113,021	506,242
1929	69,926	576,168
1930	73,751	649,919
1931	48,867	698,786
1932	10,663	709,449
1933	4,109	713,558
1934	30,396	743,954
1935	44,841	788,795
1936	†154,129	1,042,924
1937	198,581	1,241,505
1938	*220,000	*1,461,505

† New users in 1936 actually totaled 154,129 but 100,000 previously electrified farms were added in the year by reason of a new definition of a farm by the census bureau. * Estimated.

1,500,000 Electric Refrigerators, 360,000 Ranges This Year



■ APPLIANCE manufacturers will sell 1,500,000 electric refrigerators and 360,000 electric ranges during 1939, F. B. Williams Jr., vice president, Westinghouse Electric & Mfg. Co., estimated last week at the preview of his company's new models at the Waldorf-Astoria, New York.

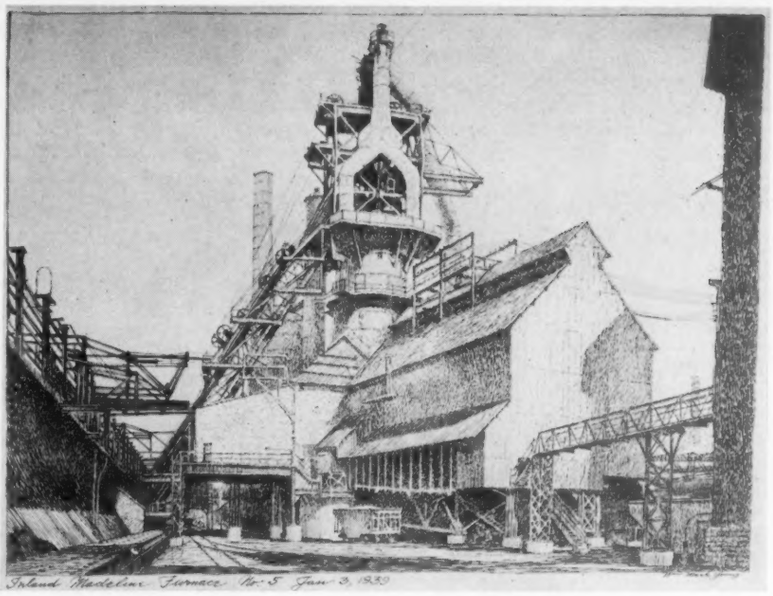
Mr. Williams emphasized the important role played by inventories in this forecast. "At this time last year," he said, "there were approximately 600,000 1937-model refrigerators in manufacturers' and distributors' stocks which had to be sold in 1938 at reduced prices . . . The best estimate of the number of 1938 model refrigerators in manufacturers' and distributors' stocks is 120,000."

R. C. Cosgrove, manager, Westinghouse household refrigerator department, pointed out that 50 per cent of the 22,000,000 wired homes today have no electric refrigerators.

Mr. Cosgrove said part of the 1939 market would be in the estimated 500,000 housing units to be built, almost all of which will be equipped with electric refrigeration. Rural electrification should offer a market for 100,000 units.

The estimate for a 21 per cent increase in electric range sales is founded on "the trend toward the simplicity and convenience of electric cookery," according to Reese Mills, manager, range and water heater department. He said a national survey disclosed 52 per cent of the women interviewed considered electric cooking superior to other types; 33 per cent said their next stove would be electric.

In photo at left, a special, automatic welding machine attaches back plate to continuous strip forming the top and sides of refrigerator cabinet at the Westinghouse Mansfield, O., works. The 152 welds are made six points at a time.



■ **Metal-etched plaque of Inland's Madeline furnace No. 5, which was presented to L. E. Block, P. D. Block, G. H. Jones and Mrs. Madeline Block Straus by Wilfred Sykes, assistant to the president, at the lighting ceremony. Etching is by Artist William Mark Young**

Inland's New Blast Furnace Christened with Old-Time Ceremony

■ TRADITIONAL ceremony was observed last Tuesday when Inland Steel Co. lighted its fifth and largest blast furnace at Indiana Harbor, Ind. Company officers, directors and their wives participated in an interesting program commemorating the event.

Mrs. Madeline Block Straus pressed a button, lighting the furnace. A plaque, consisting of an etching of the furnace on metal mounted on an ebony base, was presented to L. E. Block, P. D. Block, G. H. Jones and Mrs. Straus by Wilfred Sykes, assistant to the president. At noon luncheon was served in the Inland administration building.

H. W. Johnson, blast furnace superintendent, explained the old-time ceremony of lighting a new stack and recalled the importance attached by early settlers to completion of a plant that would supply iron for essential implements.

"In our time we are inclined to consider the ritual rather lightly—the custom has less significance," said Mr. Johnson. "This is natural because the effect on our lives is further removed. We have the necessary pots and pans; we do not have to wait for iron to be made to get the necessities of life—but the event is still important.

"Modern society is built on the foundation of steel. The advance of civilization can be measured by the increase in the use of this metal."

E. L. Ryerson Jr., vice chairman of Inland's board, described the new furnace as the culmination of the broad building program started in 1930. He emphasized that this growth typified that of Chicago and the Middle West, and paid high tribute to the courage and foresight of the company's founders.

"We pause to do honor to three men who are with us today who have done so much to make all this possible, Mr. L. E. Block, Mr. P. D. Block and Mr. G. H. Jones," he said. "And because Inland is so essentially the product of this great industrial district I am sure everyone in the Middle West will likewise think of this ceremony as one that does honor to these men.

"How fantastic it must seem to them that this great enterprise has come from those small beginnings at Chicago Heights in 1893. In those days a full year's production was no more than this plant now turns out in a single day. Because of their great courage and intelligence the business went steadily ahead from the very beginning. Much of their original capital was borrowed and often they were not certain where the money would come from to meet the next payroll. But they always believed in their enterprise and in the Middle West as the region of the future . . . . .

"In 1930, when the industrial outlook was at its darkest, they conceived and undertook the company's greatest building program. It took stout hearts to do this but today their wisdom has been abundantly justified, and now when the time comes for our country to go forward

■ **Madeline Block Straus maintains tradition by lighting Inland Steel's new 1000-ton blast furnace, Madeline No. 5. Mrs. Straus, daughter of President P. D. Block, has lighted every Inland furnace since the first, Madeline No. 1, in 1907. Left to right: Mrs. Straus, G. H. Jones, L. E. Block, P. D. Block**

in another great period of prosperity Inland will be ready."

Inland has been typical of the progressive modernization technique of American business. The company was organized in the depression year, 1893; built its first blast furnace in 1907; and during the depths of the depression in 1932 constructed one of the country's first wide continuous strip mills, a 76-inch mill, with capacity to produce 50,000 tons of strip steel a month.

A year later Inland had completed new tin mills and subsequently, a new bar mill was built, and an entire galvanizing plant was reequipped to produce better products.

During the past year, the company completed a new 44-inch continuous strip mill which can roll a mile of steel, a yard wide, in 2½ minutes; 59 new coke ovens and five new open hearths which increase steelmaking capacity 18 per cent.

Capacity Increased

A year ago Inland announced an increase in flat-rolled steel capacity from 700,000 to 1,100,000 gross tons per year. The new open hearths have brought the company's total steelmaking capacity to 2,760,000 gross tons a year.

Completion of the No. 5 blast furnace, with daily capacity of 1000 tons, increases Inland's equipment for making pig iron to more than 4000 tons per day.

The stack was installed by Arthur G. McKee & Co., Cleveland, who in 1907 designed and built Inland's first blast furnace, now known as the Madeline No. 1.

Since the Inland plant is located on the sandy shore of Lake Michigan at Indiana Harbor, it was necessary to construct the stack on step-tapered piles 90 feet in length, and which are driven into hard pan. The cast house is supported by spread footings, and the dust catcher and skip hoist rest on H-beam piles. Stove foundations are of reinforced concrete cellular construction.

Bell Is Rigid

Furnace has 14 tuyeres and seven columns. These columns are 426-pound H-beams with 2-inch cover plates. Hearth diameter is 25 feet, and diameter at the top of the bosh is 28 feet. Stockline diameter is 19½ feet with provision for increasing to 21 feet if desired in the future. The large bell, 14½ feet, is rigidly connected with the bell rod.

For the purpose of taking accurate temperature readings an intermediate platform has been erected on the furnace shell about 26 feet below the top platform. The entire top structure is independent of uptakes. The bells and bell operating rigs and their sheaves are supported on the top structure.

The large bell operating mechanism is of a new type construction in that it uses a bell crank action rather than the conventional bell beam. Another unusual feature is the short distance of 22 feet, 11 inches from the dumping point of the skip car to the bottom of the large bell hopper. This is considerably shorter than average and minimizes breakage of material.

Gas is taken off at four points spaced 90 degrees apart. Because of the special construction the length of travel of the gas through each offtake is exactly the same, which assures uniform gas distribution in the furnace stack as far as may be influenced by this equipment.

The cast house utilizes four 100-ton mixers and eight 400 cubic foot slag ladles.

Except for around the furnace, where the pavement is brick, the cast house floor is made of removable steel plates.

MEETINGS

TO DISCUSS IMPROVEMENTS FOR GREAT LAKES HARBORS

■ LEADERS representing various social and economic interests will speak at the Great Lakes River and Harbor Development conference in the Palmer House, Chicago, Jan. 11. The meeting is sponsored jointly by the Harbor and Waterways committee of the Chicago Association of Commerce and the River and Harbor Improvement Association of Cleveland. Aim of the conference is to focus public attention on the value of and need for maintenance and improvement of channel and harbor facilities as vital factors in national economy and security.

PLAN TWO SYMPOSIUMS FOR A.S.T.M. REGIONAL MEETING

Two symposiums, one on thermal insulating materials and the other on lime, will feature the regional meeting of the American Society for Testing Materials at the Deshler-Wallick hotel, Columbus, O., March 8. The meeting is to be held in conjunction with the annual group meetings of society committees, March 6-10.

Steel Employment Rises, in Numbers and Hours

■ LONGER work weeks raised average weekly earnings of steelworkers to $28.56 in November, highest weekly average since September, 1937, when it was $31.02. The November figure compares with $25.96 in October and $22.49 in November, 1937. It exceeds by $10.13 the average wage in January, 1938, but is $6.79 under the 1937 high of $35.35 received by steelworkers in April.

Total payrolls, number of employes and average hourly wages gained in November, according to the American Iron and Steel institute. More than 14,000 employes were added to payrolls to bring the total to 450,000, highest level in eight months.

Payrolls in November were $61,054,000, compared with $56,176,000 in October, and with $62,119,000 in November, 1937. Wage-earning employes earned 83.5 cents an hour, compared with 83.2 cents in October, and 81.5 cents in November, 1937.

For the first 11 months of 1938, steel industry payrolls totaled $553,944,000, a decrease of about 40 per cent from the $924,016,000 in the corresponding period of 1937. Ingot production for the first 11 months of 1938 was 24,696,092 tons, a reduction of 48 per cent from the 48,029,886 tons produced in the first 11 months in 1937.

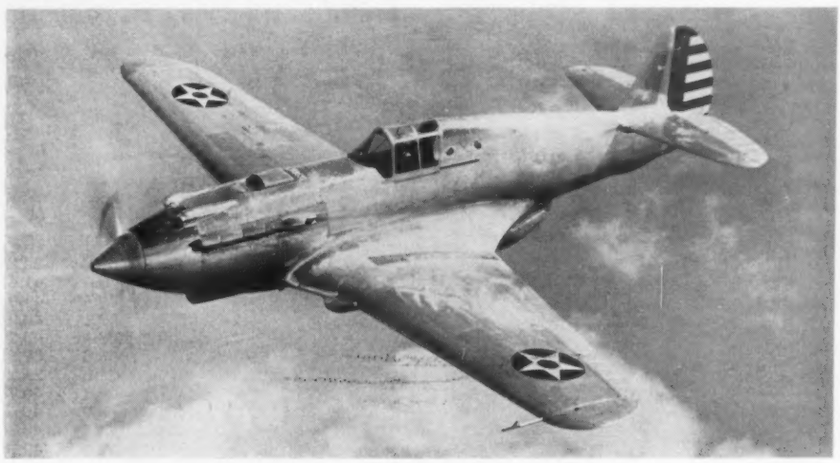
		Ingot Output Gross Tons	Number of Employes	Total Payrolls	Average Hourly Wages	Average Hours Per Week
1937	Jan.	4,718,436	547,997	$76,423,054	72.5	40.5
	Feb.	4,414,699	556,077	74,277,665	72.8	42.5
	March	5,218,326	577,050	90,863,016	79.3	42.5
	April	5,070,867	589,351	94,321,859	85.6	41.3
	May	5,151,909	595,354	92,931,305	86.6	38.6
	June	4,184,723	555,743	87,519,613	87.7	39.2
	July	4,556,304	593,906	90,549,660	86.8	37.3
	Aug.	4,877,826	603,106	92,663,389	86.1	37.9
	Sept.	4,289,507	602,729	86,160,875	84.3	36.8
	Oct.	3,392,924	586,644	76,191,149	82.5	31.9
	Nov.	2,254,365	551,158	62,119,455	81.5	27.6
	Dec.	1,473,021	508,000	52,062,000	81.7	23.4
1938	Jan.	1,732,764	475,000	47,578,000	80.5	22.9
	Feb.	1,703,726	461,000	45,599,000	81.3	25.0
	March	2,012,406	455,000	51,386,000	81.8	26.7
	April	1,925,166	445,000	47,809,000	82.6	25.6
	May	1,806,805	436,000	46,757,000	83.6	24.4
	June	1,638,277	424,700	46,706,000	84.5	24.3
	July	1,982,058	424,400	45,802,000	84.8	25.6
	Aug.	2,546,988	427,000	52,712,000	83.2	29.4
	Sept.	2,657,748	431,000	52,365,000	83.0	30.0
	Oct.	3,117,934	436,000	56,176,000	83.2	31.2
	Nov.	3,572,220	450,000	61,054,000	83.5	34.2

Claim $150,000,000 Backlog for Aircraft; Situation in the Industry

■ AMERICA'S aircraft industry heads into 1939 confident of another "best year in history." Leaders look for continuance of that remarkable growth which has lifted it to major importance in metalworking.

Earnings are consistently rising; the 1938 income was the highest yet recorded. Seven leading manufacturers showed net profits aggregating $11,529,105 for nine months, 74 per cent over 1937.

Production of planes, engines and parts reached a new peak for the full year. Output valued at $130,000,000 was 12.3 per cent above $115,000,000 in 1937. Previous totals: 1936, $78,150,000; 1935, $42,500,000.



■ **This latest Curtiss-Wright all-metal pursuit plane now undergoing army air corps tests is described as "the world's fastest military craft" although its actual performance is closely guarded. Speediest fighting planes heretofore have been known to exceed 300 miles per hour**

Production has slowed from the speed in the first half of 1938, but this is not viewed as an important reversal. The industry now has a $150,000,000 order backlog.

First half 1938 output was abnormally heavy as the industry was working out of assembly delays. More normal schedules were resumed in the second six months, but were depressed incidental to model changes.

Considerable plant expansion is noted, but this is not of the spectacular character which was widely anticipated.

Among the most substantial of recent programs was the $2,500,000 plant construction of Glenn L. Martin Co., Baltimore. This company has since added a stamping department, and now is building a 500-acre airfield at initial cost of $250,000.

Lockheed Aircraft Corp., Burbank, Calif., is spending $100,000 for a new assembly hangar, and $95,000 on an addition to its engineering building.

Vega Airplane Co., a Lockheed subsidiary, has acquired a 77,000-square foot plant at Burbank and is remodeling it for manufacturing purposes.

National defense undoubtedly is the industry's biggest question mark. President Roosevelt's special message on armament may tend to clarify aircraft's part in the program. Mentioned have been air force increases involving up to 13,000 planes. Present first-line craft number about 3000. Contrary to popular belief, the possible heavy national defense orders for military planes are not expected to result in any important expansion of production facilities. Present output is using less than half of capacity, and deliveries can be sufficiently accelerated by adding working shifts and speeding up assembly methods.

A likely development, however, would be adoption of the automobile industry's mass-production technique—accompanied by purchase of equipment and machine tools.

Aircraft builders are becoming heavily dependent on foreign orders. Last year such buying accounted for more than half of production. In 11 months aeronautic exports totaled $62,439,412, up 76 per cent from the same period, 1937.

Attention also has been called to declining civil aircraft sales and disproportionate output of war planes. During the first nine months in 1938 nearly 28 per cent fewer aircraft were delivered to domestic civil buyers, while production for military service advanced 95 per cent.

One step leading to recovery of civil markets was taken recently by manufacturers when they agreed to join airline operators in a $300,000 educational advertising program to increase public flying.

Despite record passenger and mail volumes, the domestic air transport industry last year was in the red. But with civil aeronautics authority well disposed toward raising mail rates, business conditions improving, and accident rates declining, the airlines should be benefited.

Many companies need new transport equipment and increased income figures to bring out considerable buying.

FRANCE IN MARKET FOR 1050 AMERICAN PLANES

Reports that France contemplates purchasing 1050 military planes in this country at cost of $150,000,000 have been confirmed by its air ministry. Included are pursuit, bomber and attack planes. At the same time it was announced that American technicians will be hired to improve French domestic production.

COMPANIES PROTEST BAN ON RELEASE OF AIRCRAFT DATA

War department orders last week went out to all airplane and parts manufacturers prohibiting publication of data relating to purchases and production of military and export planes. Stated reason was that the news gives foreign nations access to information which should not be revealed.

Companies are attempting to have the ban liberalized, calling attention to SEC regulations requiring disclosure of facts to stockholders.

Railway Purchases Drop 55 Per Cent in 1938

■ Material and equipment orders by railroads in 1938 declined $477,000,000 from the 1937 level, according to *Railway Age*. Material purchases, used principally for maintenance, amounted to $340,000,000 last year, smallest of any year in the depression except 1932 and 1933. Such buying in 1937 totaled $697,402,000.

Equipment orders in 1938 amounted to about $54,000,000, compared with $173,320,000 in 1937.

Orders for freight cars declined from 67,544 in 1936 and 52,738 in 1937 to 16,539 in 1938. Locomotive orders fell from 533 in 1936 and 368 in 1937 to 228 in 1938. Passenger car orders totaled 269, compared with 829 in 1937.

Only 38 miles of new line was built, lowest of record except 1933.

1938 Pig Iron Output Smallest in Four Years; Decrease in December

■ WITH a total of only 18,889,663 gross tons, production of coke pig iron in the United States in 1938 made the poorest showing for any year since 1934, when output was 15,977,679 tons. Compared with 36,709,139 tons produced in 1937, last year's total fell short by 17,819,476 tons, or 48.6 per cent. Since the beginning of the depression in 1930, there were only three years in which tonnage was below that of 1938; namely, 1932 with 8,674,067 tons; 1933 with 13,221,707 tons and 1934.

Production in December amounted to 2,212,718 gross tons, 73,943 tons, or 3.2 per cent, less than the November total of 2,286,661 tons, which was the highest for any month in the year and the best since October, 1937. Despite its loss, however, December output proved to be the second largest month in 1938. Production in December, 1937, was 1,503,474 tons.

MONTHLY IRON PRODUCTION

Gross Tons

	1938	1937	1936
Jan.	1,444,862	3,219,741	2,029,304
Feb.	1,306,333	3,020,006	1,838,932
March	1,470,211	3,470,470	2,046,121
April	1,388,008	3,400,636	2,409,474
May	1,260,937	3,545,180	2,659,643
June	1,060,747	3,115,302	2,596,528
July	1,213,076	3,501,359	2,595,791
Aug.	1,495,514	3,616,954	2,711,726
Sept.	1,683,097	3,417,960	2,728,257
Oct.	2,067,499	2,891,026	2,991,794
Nov.	2,286,661	2,007,031	2,949,942
Dec.	2,212,718	1,503,474	3,125,192
Total	18,889,663	36,709,139	30,682,704

Daily average output in December was 71,378 gross tons, a loss of 4844 tons, or 6.35 per cent, compared with the November rate of 76,222 tons. This was the lowest daily output since October, 1938, with 66,694 tons. Production for December, one year ago, averaged 48,499 tons daily.

Relating production to capacity, operations in December averaged 51.4 per cent. This compared with 55 per cent in November, 48 in October and 40.5 in September. December, 1937, operations were at a rate of 35.6 per cent.

A net loss of six stacks during December dropped the total operating at the close to 115 on Dec. 31. During December, two merchant stacks and eight steelworks units became inactive. One merchant and three nonmerchant furnaces resumed. Active stacks at end of December, 1937, totaled 93. Low point for stacks in 1938 occurred in June with 67 in operation.

Furnaces blown in during December were: In Ohio: Hamilton No. 2, Hamilton Coke & Iron Co.; one Cleveland, Otis Steel Co.; Anna, Struthers Iron & Steel Co. In Pennsylvania: Bethlehem F, Bethlehem Steel Co.

Stacks blown out or banked were: In Ohio: River No. 1 and Youngstown Nos. 2 and 5, Republic Steel Corp.; one Ohio, Carnegie-Illinois Steel Corp. In Pennsylvania; Carrie No. 1, Carnegie-Illinois Steel Corp.; Neville Island, Pittsburgh Coke & Iron Co.; Shenango No. 1, Shenango Furnace Co. In West Virginia: Riverside, Wheeling Steel Corp. In Maryland: Maryland A, Bethlehem Steel Co. In Indiana: Gary No. 11, Carnegie-Illinois Steel Corp.

AVERAGE DAILY PRODUCTION

Gross Tons

	1938	1937	1936	1935
Jan.	46,608	103,863	65,461	47,692
Feb.	46,655	107,857	63,411	57,675
March	47,426	111,951	66,004	57,120
April	46,267	113.354	80,316	55,719
May	40,675	114,360	85,795	55,986
June	35,358	103,843	86,551	51,949
July	39,131	112,947	83,735	49,043
Aug.	48,242	116,676	87,475	56,767
Sept.	56,103	113,932	90,942	59,009
Oct.	66,694	93,259	96,509	63,818
Nov.	76,222	66,901	98,331	68,876
Dec.	71,378	48,499	100,813	68,242
Ave.	51,752	100,573	83,832	57,691

Ratio of Nonbessemer Ore Slightly Lower

■ Of the total 19,070,404 tons Lake Superior iron ore shipped in 1938, 72.8 per cent, or 13,899,950 tons, was nonbessemer. In 1937 nonbessemer represented 74.2 per cent of 61,972,823 tons shipped. Bessemer ore in 1938 amounted to 4,223,486 tons, 22.1 per cent of the total, while in 1937 it was 20.9 per cent. The proportion of manganiferous and siliceous ore to the total shipments remained substantially unchanged during both years.

DECEMBER IRON PRODUCTION

	No. in blast last day of Dec.	Nov.	Total tonnage Merchant	Nonmerchant
Ohio	30	31	57,518	474,848
Penna.	28	30	41,421*	503,104*
Alabama	16	16	87,398	163,880
Illinois	9	9	36,783	173,680
New York	9	9	41,212	106,627
Colorado	1	1		
Indiana	8	9	6,458*	344,312
Maryland	4	5		
Virginia	1	1		
Kentucky	1	1		
Mass.	0	0		
Tenn.	0	0		
Utah	1	1	0	175,477
West Va.	2	3		
Michigan	4	4		
Minnesota	1	1		
Missouri	0	0		
Total	115	121	270,790*	1,941,928*

*Includes ferro and spiegeleisen.

R. H. Irons Dies in Naples; Entered Steel Mills at 16

■ Robert Hatfield Irons died in a hospital in Naples, Italy, Jan. 5 while on a two-month cruise with Mrs. Irons, to Italy, Egypt and the Holy Land. He had been in ill health before sailing from New York Dec. 5.

Mr. Irons entered the employ of the Central Iron & Steel Co., Harrisburg, Pa., in 1892, was appointed general superintendent in 1912, elected president in 1916 and continued in that capacity until his death. He was 62 years of age.

Mr. Irons was past president of the Association of American Steel Manufacturers. He was a member of the American Iron and Steel institute, (British) Iron and Steel institute, American Institute of Mining and Metallurgical Engineers, American Society of Mechanical Engineers, American Society for Metals, American Society for Testing Materials, Engineers' Society of Pennsylvania, Franklin institute, Philadelphia, India House, New York, the Harrisburg club, Harrisburg, and numerous civic organizations in Harrisburg.

RATE OF OPERATION

(Relation of Production to Capacity)

	1938[1]	1937[2]	1936[3]	1935[4]
Jan.	33.6	76.6	48.2	34.2
Feb.	33.6	79.5	46.4	41.4
March	34.2	82.5	48.5	41.0
April	33.4	83.7	59.1	40.0
May	29.4	84.3	63.1	40.2
June	25.5	76.6	63.6	37.2
July	28.2	82.9	61.5	35.2
Aug.	34.8	85.7	64.3	40.7
Sept.	40.5	83.7	66.9	42.5
Oct.	48.0	68.4	71.0	45.8
Nov.	55.0	49.3	72.3	49.5
Dec.	51.4	35.6	74.2	49.0

[1] Based on capacity of 50,606,400 gross tons, Dec. 31, 1937; [2] first half on capacity of 49,512,737 tons, Dec. 31, 1936—second half on capacity of 49,727,737 tons, June 30, 1937; [3] capacity of 49,777,893 tons, Dec. 31, 1935; [4] capacity of 50,845,741 tons, Dec. 31, 1934. Capacities by American Iron and Steel institute.

For Chilled Car Wheels

■ Association of Manufacturers of Chilled Car Wheels has established a research project on chilled irons for use in car wheels, at Battelle Memorial institute, Columbus, O. Material in current use and new compositions in the iron carbon group of metals will be studied.

Ingots Only 56% Of 1937 Total

■ STEEL ingot production in 1938 totaled 27,839,261 gross tons, 56.2 per cent of the 49,502,907 tons in 1937, according to the American Iron and Steel institute. This is the smallest tonnage for any year since 1934, when output was 25,599,118 tons. Average weekly production in 1938 was 533,933 tons, at 39.79 per cent of capacity, compared with 949,423 tons, 72.38 per cent, in 1937.

December output was 3,143,169 tons, at 53 per cent of capacity. against 3,572,220 tons in November, at 62.05 per cent. Except for November, 1938, the December total was the largest since October, 1937, with 3,392,924 tons.

Growing importance of open-hearth steel over bessemer is shown by the fact the former was produced at 40.86 per cent of capacity for the year and the latter at only 29.20 per cent.

While the capacity engaged in December, based on actual output, is given as 53 per cent, the average of STEEL's weekly estimates of activity was 53.26 per cent.

District Steel Rates

Percentage of Ingot Capacity Engaged In Leading Districts

	Week ended Jan. 7	Change	Same week 1938	Same week 1937
Pittsburgh ...	44	+18	25.5	80
Chicago	53	+ 7	24.5	77
Eastern Pa...	34	+ 5	31	53
Youngstown..	50	+18	24	78
Wheeling	64	+14	26	94
Cleveland ...	54	+ 4	26	80
Buffalo	44	+ 4.5	23	84
Birmingham..	77	None	63	76
New England	70	None	19	85
Cincinnati ...	72	+22	0	96
St. Louis.....	45.5	+ 3	21	80
Detroit	91	+12	33	95
Average....	51.5	+11.5	26	79.5

Reading Iron Co. To Raze 85 Idle Buildings

■ To reduce tax bills, the Reading Iron Co. has been authorized to raze 85 buildings at its three idle plants in Reading, Pa., including its wrought iron pipe mills. The company is in reorganization proceedings under federal laws.

Plants to be razed once employed 3500 people. All have been idle from eight months to two years. Only plant not to be razed is a nail mill.

Steel Ingot Statistics

Monthly Production—Complete for Bessemer; Open Hearth, Calculated from Reports of Companies Making 98.29 per cent in 1936

1938	—Open Hearth— Gross tons	Per cent of capacity	—Bessemer— Gross tons	Per cent of capacity	— Total — Gross tons	Per cent of capacity	Weekly production, all companies, gross tons	Number of weeks in month
Jan.....	1,632,773	30.25	99,991	18.27	1,732,764	29.15	391,143	4.43
Feb.....	1,578,233	32.38	125,493	25.40	1,703,726	31.74	425,931	4.00
March.....	1,854,669	34.36	157,737	28.83	2,012,406	33.85	454,268	4.43
April.....	1,793,522	34.31	131,644	24.84	1,925,166	33.44	448,757	4.29
May.....	1,676,215	31.06	130,590	23.87	1,806,805	30.39	407,857	4.43
June	1,519,589	29.07	118,688	22.40	1,638,277	28.46	381,883	4.29
July.....	1,854,076	34.43	127,982	23.44	1,982,058	33.42	448,429	4.42
Aug.	2,350,199	43 54	196,789	35.97	2,546,988	42.85	574,941	4.43
Sept.	2,449,861	46.98	207,887	39.32	2,657,748	46.28	620,969	4.28
Oct.....	2,894,726	53.63	223,208	40.79	3,117,934	52.45	703,823	4.43
Nov.....	3,370,974	64.50	201,246	37.98	3,572,220	62.05	832,685	4.29
Dec.....	2,984,204	55.42	158,965	29.12	3,143,169	53.00	711,124	4.42
Total	25,959,041	40.86	1,880,220	29.20	27,839,261	39.79	533,933	52.14
1937								
Jan.....	4,426,227	84.07	292,209	54.38	4,718,436	81.32	1,065,110	4.43
Feb.....	4,083,070	85.89	331,629	68.34	4,414,699	84.27	1,103,675	4.00
March.....	4,814,926	91.45	403,400	75.07	5,218,326	89.94	1,177,952	4.43
April.....	4,682,084	91.83	388,783	74.71	5,070,867	90.25	1,182,020	4.29
May.....	4,769,238	90.59	382,671	71.21	5,151,909	88.79	1,162,959	4.43
June	3,900,108	76.50	284,615	54.69	4,184,723	74.48	975,460	4.29
July.....	4,220,848	80.10	335,456	62.56	4,556,304	78.48	1,030,838	4.42
Aug.....	4,504,567	85.29	373,259	69.46	4,877,826	83.83	1,101,089	4.43
Sept.....	4,021,035	78.80	268,472	51.71	4,289,507	76.30	1,002,221	4.28
Oct.....	3,204,209	60.67	188,715	35.12	3,392,924	58.31	765,897	4.43
Nov.....	2,040,480	39.90	113,885	21.88	2,154,365	38.23	502,183	4.29
Dec.....	1,386,188	26.31	86,833	16.19	1,473,021	25.37	333,263	4.42
Total	46,052,980	74.20	3,449,927	54.54	49,502,907	72.38	949,423	52.14

Percentages of capacity operated for 1938 are calculated on weekly capacities of 1,218,342 gross tons of open-hearth ingots and 123,514 gross tons of bessemer ingots, total 1,341,856 gross tons; based on annual capacities as of Dec. 31, 1937, as follows: Open-hearth ingots, 63,524,356 gross tons; bessemer ingots, 6,440,000 gross tons.

Percentages of capacity for the first six months of 1937 are calculated on weekly capacities of 1,188,452 gross tons for open-hearth ingots, 121,308 tons for bessemer and 1,309,760 tons total, based on annual capacities as of Dec. 31, 1936, as follows: Open-hearth ingots, 61,965,862 gross tons; bessemer, 6,325,000 tons; beginning July 1, 1937, on weekly capacities of 1,192,182 gross tons open-hearth ingots and 121,308 gross tons bessemer, total 1,313,490 gross tons; based on annual capacities as follows: Open-hearth ingots, 62,160,362 gross tons; bessemer, 6,325,000 gross tons.

PRODUCTION

■ STEELWORKS operations last week advanced in ten districts and remained stationary in two. The national rate is estimated at 51.5 per cent, 11.5 points higher than the preceding week.

Youngstown, O. — Increased 18 points to 50 per cent, with 48 open hearths and two bessemers active. An advance to 55 per cent is scheduled for this week as Carnegie-Illinois Steel Corp. starts double turn on its bessemers. Ohio Works of Carnegie-Illinois broke all production records in November with 107,400 tons of ingots. Its previous monthly record was 106,000 tons in 31 days of March, 1937.

New England — Unchanged at 70 per cent, with prospects for an increase this month.

Cleveland—Addition of two open hearths by one interest and dropping of one by another gave a net increase of 4 points to 54 per cent. Further additions are scheduled for this week.

Buffalo — Two open hearths were added increasing the rate 4.5 points to 44 per cent.

St. Louis — Rise of 3 points to 45.5 per cent resulted from lighting of an open hearth by an east side producer. Two more furnaces are scheduled to be lighted this week.

Cincinnati — A steelmaker whose plant had been down for a week resumed with five open hearths, the rate advancing 22 points to 72 per cent.

Chicago — Up 7 points to 53 per cent, due to increased output by three independents. A new blast furnace has been blown in by Inland Steel Co.

Pittsburgh — Advanced 18 points to 44 per cent following holiday interruptions. Indications are for further gains this week.

Wheeling — Longer week and increased active capacity brought a rise of 14 points to 64 per cent.

Detroit — Recovery of 12 points to 91 per cent more than balanced the holiday loss. One producer took off two furnaces early in the week for repairs, the other continued eight open hearths all week and is expected to light another one this week.

Birmingham, Ala. — Unchanged at 77 per cent, with 17 open hearths in operation. Pullman-Standard Car Mfg. Co. plant at Bessemer, Ala., will resume Jan. 16 after being shut down five weeks.

Central eastern seaboard — Regained 5 points to 34 per cent, with expectations of further advance of 1 or 2 points soon.

MUSIC WIRE

BY

WASHBURN

Washburn wire makers are skilled craftsmen who have been schooled by long experience in the highest standards of quality workmanship. Talent and the most up-to-date equipment produce clean, uniform wire . . . straight throughout the coil, and held to close tolerances in all physical requirements.

The operations of making Eagle Music Wire are exercised with extreme care. To maintain a bright, clean surface, the finished wire is handled with gloves to prevent perspiration marks which lead to rust and finally to surface pitting.

Specify Eagle Music Wire for superlative quality.

WASHBURN WIRE CO., PHILLIPSDALE, R. I.

WASHBURN WIRE CO., Inc., NEW YORK CITY

Washburn

CLEAN UNIFORM BILLETS - STRIP - RECTANGULAR, ROUND, FLAT RODS
TEMPERED AND UNTEMPERED FLAT AND ROUND HIGH CARBON WIRES

Windows of WASHINGTON

BY L. M. LAMM
Washington Editor, STEEL

WASHINGTON

■ CLEARLY indicated when President Roosevelt addressed congress on the state of the union was the fact many members favor curtailment of expenditures.

Congressmen, it appeared from applause and from statements made by many following the speech, are willing to take the blame, if any, for reducing the spending program.

If hand clapping means anything, members of both houses applauded at just the wrong times in the President's speech — at least from his standpoint. This was particularly true when he dealt with a sixty-billion-dollar or eighty-billion-dollar nation.

Mr. Roosevelt said that in his opinion it would not be right "for the federal government to consider a drastic curtailment of its own investments" at this time. "The whole subject of government investing and government income," he said, "is one which may be approached in two different ways.

Advises Continued Spending

"The first calls for the elimination of enough activities of government to bring the expenses of government immediately into balance with income of government. This school of thought maintains that because our national income this year is only sixty billion dollars, ours is only a sixty-billion-dollar country; that government must treat it as such; and that without the help of government, it may some day, somehow, happen to become an eighty-billion-dollar country.

"If the congress decides to accept this point of view, it will logically have to reduce the present functions or activities of government by one-third. The congress will have to accept the responsibility for such reduction; and the congress will have to determine which activities are to be reduced."

The Chief Executive called attention to the fact that congress alone has the power to curtail expenditures as it is the appropriating branch of the government. He referred to curtailed expenditures in aids to agriculture and soil conservation, highways, waterways, etc.

In referring to another approach to the spending situation, the President said: "the other approach to the question of government spending takes the position that this nation ought not to be and need not be only a sixty-billion-dollar nation; that at this moment it has the men and the resources sufficient to make it at least an eighty-billion-dollar nation. This school of thought does not believe that it can become an eighty-billion-dollar nation in the near future if government cuts its operations by one-third. It is convinced that if we were to try it, we would invite disaster—that we would not long remain even a sixty-billion-dollar nation. There are many complicated factors with which we have to deal, but we have learned that it is unsafe to make abrupt reductions at any time in our net expenditure program."

Mr. Roosevelt made few suggestions for legislation aside from the fact that he intended to ask for reorganization of the government departments and a complete armament program. Congressmen showed enthusiasm for references by the President to protective measures for the country, and to his references to dictators, but their reactions to his increased expenditure program were unfavorable.

There is every evidence the administration will encounter difficulty when the time comes for increasing appropriations.

EXPORT LICENSING, ARMS EMBARGO BILLS INTRODUCED

A bill was introduced in the house of representatives last week by Representative Crawford, Michigan, to restrict exportation of pig iron, scrap iron and scrap steel except under license from the secretary of commerce. The bill was referred to the house committee on interstate and foreign commerce.

Mr. Crawford also introduced a joint resolution providing for an embargo on scrap iron and pig iron under public resolution number 27 of the 75th congress. The resolution was referred to the house committee on foreign affairs.

A bill was introduced in the house by Representative Hoffman, Michigan, to amend the act entitled "an act to provide for the protection and preservation of domestic sources of tin," approved Feb. 15, 1936. This bill was referred to the house committee on military affairs.

The Crawford resolution provides that whenever the President shall put the neutrality act into effect declaring an embargo on the export of arms ammunition or implements of war "he shall include scrap iron and pig iron in addition to those items enumerated in the President's proclamation of April 10, 1936."

Reintroduce Licensing Bill

Representative Ludlow, Indiana, introduced a joint resolution to prohibit the shipment of arms, ammunition and implements of war from any place in the United States. This resolution was also referred to the house committee on foreign affairs.

Senators Borah and O'Mahoney have reintroduced their bill providing for federal license for corporations doing an interstate business. This bill was bitterly opposed by industry at the last session.

REPUBLICANS, CONSERVATIVES HOLD 218 SEATS IN HOUSE

There is no indication as yet among members of congress of any kind of a coalition between the Republicans and anti-New Dealers in the Democratic party. Probably no organization will be formed but various blocs undoubtedly will arise if any radical legislation is proposed by the administration.

Following the November elections,

some predictions were made that such a coalition would come into existence but most of the newsmen in Washington who have followed the political situation over a long period of years doubted a permanent organization. It is beyond question, however, that the Republicans and conservative Democrats can control.

The Republicans now have 170 seats in the house and with 48 seats held by conservative Democrats, making a total of 218 seats, will easily be able to control the house. The country will watch this with special interest.

BURKE READY TO LEAD ATTACK ON LABOR BOARD

Senator Burke of Nebraska, a definite enemy of the national labor relations board as it is functioning, last week said there is almost a universal demand "for action that will put an end to industrial discord." Senator Burke campaigning for amendments to the labor act which he hopes will promote industrial peace and economic recovery.

Senator Burke charges the labor board has stretched provisions of a bad law to the extreme. It has gone far outside the law and tried in every conceivable way to so interpret its provisions as to most effectually harass employers and promote a particular type of labor organization, he contends.

When the opportunity is offered to present the entire record of maladministration by this government organization, the demand for change will be irresistible, Senator Burke believes.

Increasing dissatisfaction on Capitol Hill with the actions of the labor board are clearly evident and a determined effort will be made to amend the law at the current session.

Also if the President nominates Donald Wakefield Smith as a member of the board, there is every indication that his nomination will be turned down. When his term ended in October, he was reappointed by the President in a recess appointment but this has to be confirmed by the senate. The White House may decide not to submit his name in view of the determined opposition in the senate.

$135,000,000 APPORTIONED FOR HIGHWAY IMPROVEMENTS

Secretary of Agriculture Wallace has announced $135.000.000 has been apportioned to aid the states in highway improvement and elimination of grade crossings for the fiscal year beginning July 1.

The funds apportioned consist of $100.000.000 for improvement of the federal-aid highway system including extensions through cities, $15,000.000 for secondary or feeder roads and $20,000,000 to eliminate hazards at railroad grade crossings.

Wallace said that the states must put up a similar amount for the improvement except for the grade crossings, and that the funds will be expended in co-operation with the state highway departments.

ARMY MAY PURCHASE MUNITIONS MACHINERY

It is stated the United States army will purchase more than $33,000.000 worth of special munitions-manufacturing machinery to be held for an emergency. This was announced by Maj. Gen. C. M. Wesson, chief of ordnance, in an article in the semi-official *Army Ordnance*.

An appropriation of $3,700,000 was provided by congress at the last session for this purpose for the fiscal year ending June 30. Included in this machinery is equipment for powder-making and shell-loading plants, the manufacture of small arms, ammunitions and the casting of cannon.

General Wesson explained in the army publication that without such preparations, wartime production of munitions would be crippled because the special machinery requires so long to manufacture.

"For the loading of the great bulk of ammunition ultimately required in a major war, it is planned to erect new plants, all but one of which will be located west of the Appalachians," General Wesson said.

Present limited facilities are situated mainly along the Atlantic seaboard, south of New York, he noted.

Six manufacturing arsenals produce now the bulk of the army's munitions requirements, and supply some of the navy's needs. In time of war, however, private industry would be called on to produce 90 per cent of American military requirements, compared with 95 per cent in the World war.

HOPKINS WON'T RELINQUISH FOREIGN SERVICE ACTIVITIES

While the new secretary of commerce, Harry L. Hopkins, has not made any public statement, it is understood on good authority that he is anxious to retain the foreign service officers in his department rather than to have them transferred to the state department which has been under contemplation, at least by the latter organization, for sometime.

It is reported Mr. Hopkins did not take his new post with any commitment to allow the foreign service officers to be transferred without a fight. Former secretary Roper opposed the transfer, but indications were his influence was not sufficient to stop it, and it was general belief that an act would be passed by congress allowing the transfer.

There is no question but what the foreign service officers, which, of course, include commercial attaches and trade commissioners of the bureau of foreign and domestic commerce have a long tradition of useful service.

American business in the past has given this specialized service its unqualified support. Commerce officials who have been fairly familiar with the work for many years point out a transfer of this service to the state department would be risky because the consular service of the latter department as now set up cannot perform this function satisfactorily. Establishment of a new foreign commerce service under the state department and independent of the consular service would not function as well as the present service, they say. It is pointed out further by commerce officials that the reciprocal trade agreement program does not abolish the necessity for specialized work in business promotion.

Hopkins announced last week the business advisory council will meet in Washington Jan. 26 and 27. He has conferred with Averill Harriman, council chairman, and several other members. The secretary said he had not yet had a conference with E. R. Stettinius Jr., chairman, United States Steel Corp., and a council member, but added that he expected to soon.

GOVERNMENT IRON, STEEL AWARDS TOTAL $1,144,501

In the week ended Dec 31, the government purchased $875,986.56 worth of iron, steel and their products under the Walsh-Healey act. Purchases: Erie Forge Co., Erie, Pa., $143,990.86; Struthers Wells-Titusville Corp., Titusville Forge Division, Titusville, Pa., $88,104.54; Penna. Forge Corp., Philadelphia, $44,583; Allis-Chalmers Mfg. Co., Milwaukee, $43,786.90; U. S. Pipe & Foundry Co., New York, $11,744.08; Steel & Tubes, Inc., Cleveland, $70,747.36; Henry Vogt Machine Co., Louisville, Ky., $8,515.90; Bethlehem Steel Co., San Francisco, $408,350.88; The Hotstream Heater Co., Cleveland, $14,332; Mitchell Metal Products, Inc., Cleveland, $29,800; and National Tube Co., New York, $12,031.04.

For the week ended Dec. 24, government purchases totaled $268,514.92: The Burgess Co. Inc., New York City, $18,900; Hajoca Corp., Rosslyn, Va., $19,827; Noland Co. Inc., Washington, $45,266; Thomas Gregory Galvanizing Works, Maspeth, N. Y., $13,900; Lukens Steel Co., Coatesville, Pa., $44,000; Jones & Laughlin Steel Corp., Pittsburgh, Pa., $15,171; Ross Galvanizing Works, Inc., Brooklyn, N. Y., $39,000; Buffalo Forge Co., Washington, $10,132.42; Fitzgibbons Boiler Co. Inc., New York, $30,435; Hansell-Elcock Co., Chicago, $18,790; and Bethlehem Steel Co., Bethlehem, Pa., $13,093.50.

Schneiders Cede Skoda to Czechs

■ **London**—(*By Cable*)—The French Schneider interests, of Le Creusot, have ceded their controlling interest in Skoda Works, Czechoslovakia, to the Czechs. Skoda constituted an important part of the steel production capacity left to Czechoslovakia after the partition in October.

Skoda, with plants at Plzen and Hradek, has annual capacity for about 150,000 tons of raw steel, making castings and forgings. They are in the northwestern part of Czechoslovakia, close to Germany.

The transfer seems likely to remove one source of friction under German influence over Czechoslovakia.

The Schneider group controls the Czechoslovak Mining & Iron Works Co. at Trinec, which is in the portion taken over by Poland. Its pig iron capacity is about 500,000 tons annually.

BRITISH HEAVY SEAMLESS STEEL TUBE PLANT READY

Production of heavy seamless steel tubing has been started at Chesterfield, Derbyshire, England, according to *Industrial Britain*, published by Travel and Industrial Development association, London.

The new plant, which is not identified by name, consists of a piercing press and horizontal draw bench. The press, it is reported, can produce a hollow forging 9 feet long from a 20-ton ingot in one operation. The draw bench can extend the 9-foot forging to 35 feet. The press weighs 850 tons and the bench over 500 tons.

Heavy seamless tubes previously had not been produced in Great Britain and were imported. The new plant is expected to meet domestic requirements.

COLVILLES INTEGRATES SCOTTISH STEELWORKS

Colvilles Ltd., Glasgow, is completing co-ordination of its Tollcross ironworks and Clydebridge steelworks, to provide an integrated plant from iron ore to finished steel.

The blast furnaces will be the largest in Scotland and pig iron will be delivered by ladle to a pig-casting machine, or by mixers to the open-hearth furnaces. Ore and coke will be handled on belt conveyors, electrically operated.

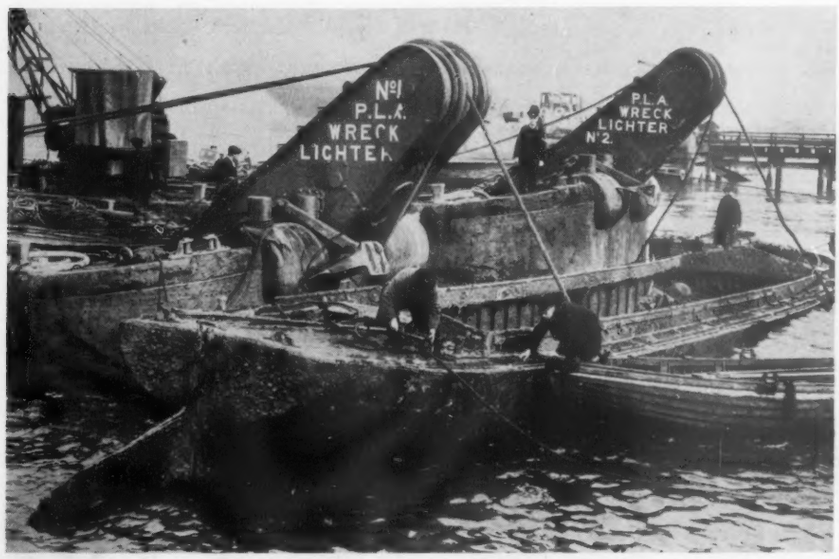
WELSH TIN PLATE WORKS MERGE TO SAVE MARKETS

Stockholders in four of the five tin plate producing companies in the Llanelly area of West Wales have voted to amalgamate, and the fifth has the proposal under consideration. Llanelly Associated Tinplate Cos. is being formed with capital of £1,000,000. The merger is to meet expected competition from the new works of Richard Thomas & Co., Ebbw Vale, recently completed. It is proposed also to erect a strip mill in West Wales.

Those joining are: Old Castle Iron & Tinplate Works, Llanelly's Western Tinplate Works, Llanelly's Kidwelly Tinplate Works and Ashburnham Tinplate Works. The fifth company is Teilo Tinplate Co. Ltd., Pontardulais.

The combined works include 42 mills and normally employ about 3000 workers. The Welsh hot mill process will be continued for the present. Elimination of wasteful competition and savings in operating costs are expected to follow.

Steel Barge Survives 26 Years at Bottom of Thames



■ **After lying in a deep hole in the bed of the Thames, London, for 26 years this steel barge was salvaged recently. Disappearing in 1912 while being towed, it was discovered during dredging operations to recover a lost anchor. NEA photo**

Collaborate on Inquiry Into Patent System

■ American Engineering council has accepted the invitation of the National Industrial Conference board to undertake a factual inquiry into the American patent system. The inquiry is to be conducted by a separate special staff employed under direction of the patents committee of the council and will be financed by funds provided by the Conference board.

The inquiry, already under way, will be studied under five main headings: I. Invention; II. Social and economic effects of Inventions; III. The Patent System; IV. Consequences of the patent system; and V. Critical review.

Technical phases of the investigation will be supervised by the council's committee on patents, while economic aspects will be analyzed by the Conference board's economists under supervision of Dr. Robert F. Martin, director of the economic research division. Much work already has been done by the council committee under chairmanship of R. S. McBride, consulting chemical engineer.

Other members of the committee are: James H. Critchett, general manager, Union Carbide & Carbon Research Laboratories Inc.; William M. Grosvenor, consulting chemist and factory engineer; Frank B. Jewett, president, Bell Telephone Laboratories Inc.; Warner Seely, secretary, Warner & Swasey Co.; and Kenneth H. Condit, executive assistant to the president, National Industrial Conference board.

Machine Tool Industry Reports Large Growth

■ Large increases in employment, wages and production in 1937 compared with 1935 were reported by manufacturers of machine tools, in the biennial census of manufactures, recently released.

Wage earners in 1937 numbered 47,266, an increase of 67.7 per cent over the 28,185 in 1935. Wages, $78,283,964, exceeded by 110.1 per cent the $37,260,518 paid in 1935. Value of products in 1937, $260,242,818, was 113.6 per cent larger than $121,832,570 in 1935.

ECONOMY — WITH A MORAL

FLAME HARDENING of steel where exceptional wear resistant properties are required is a comparatively new process, but the economies resulting from its application in conjunction with Molybdenum steels, are most significant. They are graphic proof of the cash value of constantly re-studying your production processes and material specifications in the light of improved methods.

When high wear resistance plus good physical properties are required, flame hardening makes the use of relatively inexpensive alloy steels possible. Molybdenum steels, particularly SAE 4140, 4150 and high Carbon (0.40-0.50% C) Manganese Molybdenum, are exceptionally suited for flame hardening. They are practically fool-proof. Molybdenum (next to Carbon) is the most effective hardening agent normally added to steel.

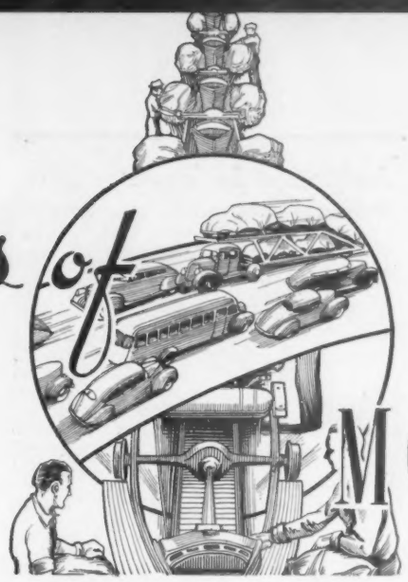
Molybdenum steels and irons make production dollars go farther in many ways. Our technical books, "Molybdenum in Steel" and "Molybdenum in Cast Iron," will be gladly sent free to any interested production executive or engineer.

PRODUCERS OF FERRO-MOLYBDENUM, CALCIUM MOLYBDATE AND MOLYBDENUM TRIOXIDE

Climax Mo-lyb-den-um Company
500 Fifth Avenue · New York City

MOLY

Mirrors of MOTORDOM



BY A. H. ALLEN
Detroit Editor, STEEL

Material appearing in this department is fully protected by copyright, and its use in any form whatsoever without permission is prohibited.

DETROIT

■ DYNAMICS of automobile demand came in for exhaustive study at a recent joint meeting of the American Statistical association and the Econometric society here during a four-day congress of 13 associations in the field of sociology and economics. A comprehensive analysis was presented by Seward L. Horner and Stephen N. DuBrul, General Motors Corp.; Charles F. Roos and Victor Von Szeliski of the Institute of Applied Econometrics; and Andrew T. Court of the Automobile Manufacturers association.

Their surveys showed that the price of new car models does not materially influence demand. Six "approximations" were offered as a guide to manufacturers in determining the effect of general business activity and national income on automobile sales.

It was assumed the present average per capita income in the United States was $500 and that bare subsistence required an annual expenditure of $173. Out of the difference, or "supernumerary income," the individual was able to buy his automobile and other necessities or luxuries. The conclusions drawn from the study indicated that:

1. A 1 per cent increase in supernumerary income will produce about a 2½ per cent increase in new car sales.
2. A 1 per cent increase in price will cause a decrease of from 1 to 2 per cent in sales.
3. A 1 per cent increase in the ratio of trade-in allowance to new car price will result in about 0.5 per cent increase in new car sales.
4. A 1 per cent decrease in the average annual depreciation rate (price of the automobile divided by the years of its life) will increase maximum ownership level by 0.3 per cent. This level is defined as the number of automobiles the population will support at any one time and under any one set of conditions.
5. A 1 per cent increase in supernumerary income will raise maximum ownership levels by about 0.25 per cent.
6. A 1 per cent increase in supernumerary income will increase replacement sales about 0.7 per cent.

Discussing an automobile price index, Mr. Court observed that price changes can be measured only in terms of value, since existing price indexes do not reflect the improvements which are made each year in automobile designs. He suggested that for an automobile price index three specifications be used for measuring change in value, namely, dry weight, wheelbase and developed horsepower.

Since 1920 the average price per pound of automobiles in the United States has dropped from 74 cents to 26 cents, or 65 per cent; price per horsepower has been reduced from $64 to $9, a drop of 85 per cent. On the basis of measuring the three specifications, which he grouped under one general term "hedonic horsepower," Mr. Court found that the automobile price index in terms of value has declined 25 per cent in the past ten years and 73 per cent in the last twenty years.

An additional factor which might be included in a price index, accord-

Prices Steady, but Auto Value Grows

■ **Although retail prices on these two cars—$661 on the 1928 model and $664 on the 1939 counterpart—were practically identical, the newer model in terms of value represents an appreciable saving. Eleven years have changed a 4-cylinder 35-horsepower Chevrolet with 107-inch wheelbase and maximum speed of 51.5 miles per hour, into a 6-cylinder 85-horsepower model, with 112¼-inch wheelbase and maximum speed of 80 miles per hour. On the table between the cars are the forged steel crankshafts from the two engines; the 1928 shaft weighs 24 pounds, while the shaft for the 1939 engine scales at 68½ pounds—185 per cent heavier**

ing to Mr. Court, is the great reduction in cost of operation due to mechanical improvements, but this of course does not take into consideration the attendant advantages to the consumer from the standpoint of comfort and convenience.

Commenting on buying habits, Mr. DuBrul pointed out the American public has approximately 25 million automobiles already and thus can afford to postpone buying new cars as soon as a business depression starts. This policy drastically curtails production and leads to serious unemployment; a condition which is, of course, not peculiar to the automobile industry alone.

Argues for Stable Prices

Certain economists have advanced the theory that the price of automobiles should be adjusted upward or downward weekly or monthly, in accordance with changes in the national income, to bring about a fluctuation of the type found in wheat and cotton in speculative markets. Mr. DuBrul believed this plan would lead to even greater instability of sales and production because it would introduce a speculative factor into dealer and consumer purchasing, heretofore absent.

Automobile Production

Passenger Cars and Trucks—United States and Canada
By Department of Commerce

	1936	1937	1938
Jan.	377,244	399,186	227,130
Feb.	300,810	383,900	202,589
March	438,943	519,022	238,598
April	527,625	553,231	238,133
May	480,518	540,377	210,183
June	469,368	521,153	189,399
July	451,206	456,909	150,444
Aug.	275,934	405,072	96,936
Sept.	139,820	175,630	89,623
Oct.	230,049	337,979	215,296
Nov.	405,799	376,629	390,350
Dec.	518,958	347,349	*412,000
Year	4,616,274	5,016,437	*2,660,681

*Estimated.

Estimated by *Ward's Reports*

Week ended:	1938	1937†
Dec. 10	100,705	85,765
Dec. 17	102,905	82,025
Dec. 24	92,890	67,230
Dec. 31	‡75,215	49,550
Jan. 7	76,685	54,084

†Comparable week.

	Week Ended Jan. 7	Dec. 31
General Motors	32,230	33,330
Chrysler	21,610	‡19,760
Ford	17,740	17,140
All others	5,105	4,985

‡Revised.

■ ONE of the so-called independent manufacturers of automobiles currently is reported to be completely redesigning the front-end appearance of the lowest-price model in its 1939 line, following an unfavorable reception on the part of the buying public. It involves complete new tools and dies for a number of parts, but the interruption to production has not been too serious.

It is said that originally this model had been worked up by engineers into an ideal streamline concept, but that by the time the "front office" finished with the proposals last fall, the original design was unrecognizable. Hence the blame for the failure of this model to click with the public is being shouldered by executives who changed the original designs, and no casualties have appeared among the ranks of designers.

Plans for putting the Hupp Skylark model into production shortly are maturing, a special stockholders' meeting being called to approve a $900,000 loan already authorized by the RFC. Further sale of present Hupp property also is contemplated to help in providing sufficient working capital to initiate production of the Skylark model. The latter, it will be recalled, is patterned after the former Cord design, and will be priced in the lowest field. The company has filed with the SEC a registration statement covering 351,714 shares of common stock which a Chicago underwriting group will sell.

A new model which has been placed in production is the custom club coupe announced last week by De Soto. With exterior lines of the conventional coupe model, the car has a rear seat 42½ inches wide, accommodating two, which may be folded up out of the way if desired. The rear seat is flanked by two unusually wide armrests in which are storage compartments for small packages.

Industrial Marketing Research Is Studied

■ Importance of industrial marketing was developed before the American Marketing association, meeting in Detroit Dec. 28-30 under chairmanship of E. C. Howell, Carboloy Co. Inc., Detroit, who is chairman of the Detroit chapter of the National Industrial Advertisers association, an affiliated group.

The place of industrial marketing in distribution was analyzed by John H. Frederick, professor of business administration, University of Texas, Austin, Tex., who presented figures from the 1935 census. In that year industrial marketing accounted for $21,145,124,000 in combined sales of manufacturers and wholesalers to the industrial field, the second most important channel of primary distribution, sales to retailers being first.

Elma Moulton, bureau of foreign and domestic commerce, Washington, summarized replies to questionnaires addressed to manufacturers intended to establish the degree and extent of activity in the field of market research. Eight hundred sixty nine manufacturers were questioned by mail; 556 replied and of these 188 did market research, 33.8 per cent of the total replying.

Ninety-four of those manufacturers, conducting their own market research work, reported spending $1,976,000 for such research, and 74 of them grouped appropriations for market research as follows: 69 per cent payroll, 14 per cent travel, 17 per cent other expense. In the latter group an analysis of 46 manufacturers showed a ratio of 0.025 per cent research expense to net sales.

Eighty-three manufacturers engaged outside organizations to do their market research, 42 reporting expenditures of $350,614 for this purpose.

"Vital Statistics" of Auto Industry

■ WHOLESALE value of automobiles, accessories, service equipment and replacement parts and tires produced during 1938 is placed at over $2,500,000,000 by the Automobile Manufacturers association. Summed up briefly, this gives a good picture of the size and worth of the automobile industry in the national economic life:

Car and truck sales, U. S. and Canada	2,635,000
Passenger cars	2,110,000
Trucks	525,000
Decrease from 1937	47 per cent
Wholesale value of cars and trucks	$1,616,000,000
Wholesale value of parts, accessories and tires for replacement, and service equipment	$ 980,000,000
Registrations in U. S.	
Passenger cars	25,150,000
Trucks	4,250,000
World registrations	42,900,000
Ratio of U. S. to world	68 per cent
Employment in auto, auto body and parts plants	304,000
Weekly payroll, wages	$8,650,000
Total motor vehicle user taxes	$1,525,000,000
Gas taxes, federal, state, municipal	$ 970,000,000
Ratio of motor user taxes to all taxes from all sources, federal, state, local	14 per cent

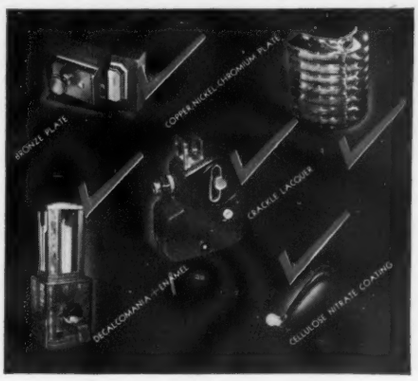
A *Quiz* FOR ENGINEERS

—AND EVERY ANSWER IS ZINC

You are probably well acquainted with ZINC Alloy Die Castings—their possibilities—their accomplishments. But this little quiz may reveal some facts that will be news to you—informative news:

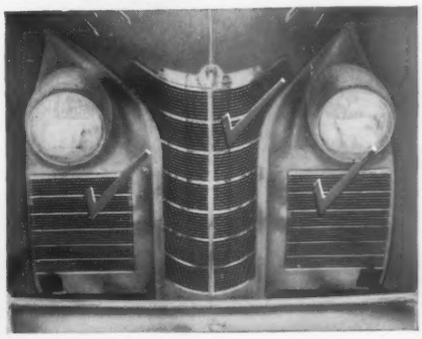
Q What Type of Metal Part Can Take Almost Any Commercial Finish?

A Electrodeposits, lacquers, paints, baking enamels, plastic coatings, decalcomanias—whatever type of finish you require—may be economically applied to the smooth "as-cast" surface of a ZINC Alloy Die Casting.



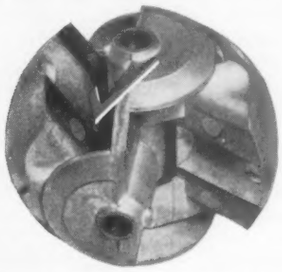
Q How Much Abuse Can You Give a Typewriter Frame?

A A frame die cast of ZINC Alloy was dropped from a second-story window onto concrete pavement without being fractured.



Q How do most automobile manufacturers make their 1939 radiator grilles—and why?

A The grilles on ten of the fifteen makes of cars in the medium and high-priced groups are die cast of ZINC Alloy. Result—sharp lines—unusual contours—unfailing accuracy of shape and dimensions. The manufacturer of the car shown here features ZINC Alloy Die Cast radiator grilles for the fifth successive year.



Q When Is a Production Method in a Class by Itself?

A When a design is as complex as this Universal Joint type rotor for an oil pump, die casting becomes the *only* means of commercial production. By any other method the machining costs would be prohibitive. The rotor is composed of three ZINC Alloy Die Cast parts.

Q How Can a Part Be Cast as Thin as a Thumbnail?

A This bicycle housing part (11¼"x5½"x2") has a wall thickness of 0.024 in., and weighs only 5½ ozs.—it's die cast of ZINC Alloy.

Quizzes keep us all informed, but if you are in any way connected with the design, manufacture or sale of metal parts, you should have the whole story on ZINC Alloy Die Castings as soon as possible. Consult any commercial die caster—or write to The New Jersey Zinc Company, 160 Front Street, New York.

ZINC ALLOY DIE CASTINGS

The Research was done, the Alloys were developed, and most Die Castings are specified with

HORSE HEAD SPECIAL (99.99+% Uniform Quality) ZINC

MEN OF INDUSTRY

■ WILLIAM BRUCE OGDEN, formerly assistant general manager of sales, Valley Mould & Iron Corp., Hubbard, O., has been appointed general manager of sales, succeeding the late Ralph C. Velte. Born in Lincoln, Nebr., Mr. Ogden received his higher education at Doane academy and Cornell university. His training in the iron and steel business was obtained with Pickands, Mather & Co., Arthur G. McKee & Co., Brier Hill Steel Co., and Republic Steel Corp., before joining Valley Mould & Iron 14 years ago.

♦

Lorin L. Ferrall, metallurgist, Timken Roller Bearing Co., Canton, O., has resigned to join Rotary Electric Steel Co., Detroit.

♦

Ernest Niederer, who recently resigned as works manager of Clearing Machine Corp., Chicago, has been appointed works manager, Verson Allsteel Press Co., Chicago.

♦

Edwin K. Adams has been appointed manager, New York office, Fort Pitt Bridge Works, Pittsburgh, succeeding Schuyler B. Knox, resigned.

♦

Charles F. Lanter has been appointed district sales manager, Fort Worth, Tex., office, Colorado Fuel & Iron Corp., Denver, with headquarters at 1503 Fort Worth National Bank building.

♦

Benjamin Schwartz, vice president of Schiavone-Bonomo Corp., New York, has been presented with the 1938 Sigma Alpha Mu Fraternity award for "outstanding contribution in industrial organization during the last ten years through the development and organization of the scrap iron industry." He formerly was director-general, Institute of Scrap Iron and Steel Inc.

P. B. Harwood

William Bruce Ogden

♦

William G. Hancock, associated with McCord Radiator & Mfg. Co., Detroit, 20 years, has been promoted from sales manager, automotive parts department, to general sales manager, directing sales in all departments.

♦

King R. H. Nelson, formerly associated with the general sales department of Carnegie-Illinois Steel Corp., Pittsburgh, has become identified with Ferdinand C. Schultz Co., representative for several mill, foundry equipment and supply firms.

♦

A. G. Delany, formerly superintendent of maintenance, Gulfsteel division, Republic Steel Corp., has been named assistant district manager. Prior to the merger of Gulf States Steel Co. and Republic he was employed by the former company for eight years as construction engineer and superintendent of maintenance.

G. H. Davis has been named master mechanic, heading the mechanical department for the Gulfsteel division, and C. R. Fletcher has been made mechanical general foreman.

♦

E. W. Seeger, assistant chief engineer, and P. B. Harwood, general engineering supervisor, Cutler-Hammer Inc., Milwaukee, have been promoted to chief engineer and assistant chief engineer, respectively. Mr. Seeger became associated with Cutler-Hammer in 1913, and during the ensuing 15 years had considerable experience in shop and engineering departments, becoming assistant chief engineer in 1928.

Mr. Harwood joined the company's training course in 1917 and shortly thereafter was transferred to the engineering department where he spent several years as a designing engineer. In 1923 he was made supervisor, steel mill control division, and in 1928 became general supervisor, engineering department.

♦

Edward Watson, refrigeration and air conditioning engineer, Worthington Pump & Machinery Corp., Harrison, N. J., has been transferred to the company's Atlanta, Ga., district sales office.

♦

Earl M. Richards, assistant to the vice president in charge of operations, Republic Steel Corp., Cleveland, since 1935, has been named assistant vice president. He will continue in charge of the operations of the corporation's subsidiaries. In 1937 C. H. Elliott also was appointed assistant vice president in charge of operations.

♦

Samuel G. Carrier has rejoined the New York sales staff of Pittsburgh Piping & Equipment Co., Pittsburgh, a position he held with the company from 1926 to 1931, when he left to organize his own firm for distributing welded boilers and air conditioning equipment.

♦

Charles H. Hughes, 270 Broadway, New York, for many years research engineer and designer of equipment for Sement-Solvay Engineering Corp., has been employed as a consulting refractory engineer by North American Refractories Co., Cleveland.

♦

John M. Birkenstock, a graduate of Stevens Institute of Technology, 1913, and associated with Green Fuel Economizer Co. Inc., Beacon, N. Y., since 1924 as sales engineer, has been elected vice president and general manager. Clinton S. Messler, vice president and chief engineer,

E. W. Seeger

has taken charge of production. He has been chief engineer since 1917 and is a graduate of Worcester Polytechnic institute 1903.

♦

Harry J. Porter has resigned as vice president, Timken Roller Bearing Co., Canton, O., after 27 years of active service. He is retained in a consulting capacity.

♦

Allan E. Ashcraft has been appointed vice president in charge of operations in the following plants of Fairbanks, Morse & Co., Chicago: Beloit, Wis.; Three Rivers, Mich.; St. Johnsbury, Vt.; San Francisco; Moline, Ill., and Stuttgart, Ark. Mr. Ashcraft, who has been vice president with offices in Beloit, has moved to Chicago.

♦

C. A. McDowell, since 1936 superintendent of rolling mills, Pittsburgh Steel Co., has become assistant superintendent of bar mills, Gary works, Carnegie-Illinois Steel Corp. He began as a roll turner

C. A. McDowell

apprentice in 1907 at the Newburg works, American Steel & Wire Co., and after four years was made roll designer and turner, a position he held until 1914. Leaving the corporation at that time he was employed by various companies as a roll designer and superintendent.

♦

W. Roy Moore, for many years vice president and general manager, Billings & Spencer Co., has become director of sales, Peck, Stow & Wilcox Co., Southington, Conn. Other changes in the Peck, Stow organization are: William O. Seifert, manager, machinery division, is now sales manager; Elmer J. Murray, traveling representative of the tools and hardware division, is now assistant sales manager, and Floyd J. Neal, formerly manager, tools and hardware division, is now manager of production.

The machinery and the tools and hardware divisions of the company are being amalgamated.

Al H. Wheeler

Who has become associated with the sales organization of Lamson & Sessions Co., Cleveland, as noted in STEEL, Jan. 2, page 292. He formerly represented American Screw Co., Providence, R. I.

♦

John B. Austin has become associated with Republic Welding & Flame Cutting Co., a division of Consolidated Iron-Steel Mfg. Co., Cleveland. He has traveled widely in an advisory capacity on arc welding problems of steel producers, railway systems, shipyards, boiler and structural shops. His contributions to the progress of arc welding have been considerable, 22 patents having been taken out on developments or processes resulting from his efforts.

♦

W. M. Farnsworth, formerly superintendent, electric furnace department, Republic Steel Corp., has been appointed general superintendent of the company's Canton, O., plant, succeeding the late B. R. Richardson. He joined United Alloy Steel Corp. in 1925 as superintendent, electric furnace department, and remained in this position through the mergers which brought that company into Republic. He will be succeeded by J. H. Kennedy, who has been with Republic or its antecedent companies since 1916.

Paul L. Walter, heretofore superintendent of power in the Canton plant, has been named superintendent of the mechanical department. Z. W. Whitehouse has been made superintendent, electrical department, Canton works.

♦

R. M. Alvord, J. E. N. Hume and A. S. Moody have been appointed commercial vice presidents, General Electric Co., Schenectady, N. Y. Mr. Alvord is manager of General Electric's Pacific district, comprising California, Arizona and western Nevada. Mr. Hume has been manager of the company's industrial department since December, 1935, and Mr. Moody has been manager Northwest district since 1936.

DIED:

■ RUSSELL B. TEWKSBURY, 79, chairman of the board and former president, Oster Mfg. Co., Cleveland, producer of dies, die heads, pipe and bolt threading and cutting machinery, in Sarasota, Fla., Jan. 1. He was one of the founders of the Oster company in 1893. He also was a director, Cleveland Tractor Co., and Electric Railway Improvement Co.

♦

William E. Arndt, 65, part owner, Mohawk Mfg. Co., Detroit, tool and die maker, in Detroit, recently.

♦

Harry M. Lewis, 50, president, National Tool Salvage Co., Detroit, in that city, Dec. 28.

♦

Aloysius J. Hanley, 47, secretary-treasurer, Wilcolator Co., Newark, N. J., maker of heat regulating devices, in Orange, N. J., Dec. 13.

♦

William B. Swift, 69, retired purchasing agent, International Harvester Co., Dec. 20 in Chicago. Mr. Swift had been with the Harvester company 42 years.

♦

John T. Ronan, president, Diamond Saw & Stamping Works Inc., Buffalo, Dec. 21. He was one of the founders of the company and associated with it 40 years.

♦

Sherman Hathorne, 74, for 30 years superintendent of the jobbing department of Chicago Hardware Foundry Co., Chicago, Dec. 20 in Jacksonville, Fla. He retired in 1930.

♦

C. B. Buerger, 58, vice president, Gulf Oil Corp., Pittsburgh, in that city, recently. He went to Pittsburgh in 1922 as assistant to vice president and in 1928 became vice president.

♦

Fred C. Dustman, 47, superintendent of Youngstown Sheet & Tube Co.'s tube mill, Youngstown, O., and also secretary and a director, Federal Iron Works, Dec. 29 in Youngstown.

♦

David A. Baum, 75, founder and president, Baum Iron Co., Omaha, Nebr., in that city, recently. He celebrated his fiftieth anniversary as head of the firm last June. He also was an officer of the Sioux City Iron Co., Sioux City, Iowa.

November Steel Imports Up 9%

■ IMPORTS of steel and iron products in November were 22,878 gross tons, scrap excluded, exceeding by 9.3 per cent the 20,921 tons imported in October, according to the metals and minerals division, department of commerce. Value of November imports was $1,402,221, or 7.8 per cent more than $1,300,714 in the preceding month. In November, 1937, imports were 23,985 tons, valued at $1,647,464.

For 11 months of 1938 imports other than scrap totaled 217,852 tons, valued at $13,595,427, 51 per cent of the comparable 1937 tonnage, and 59 per cent of it in value.

FOREIGN TRADE OF UNITED STATES IN IRON AND STEEL

Gross Tons

	1938		1937	
	Exports	Imports	Exports	Imports
Jan.	586,294	29,631	201,692	43,063
Feb.	460,640	19,589	290,987	40,728
March	526,883	11,827	570,584	51,805
April	489,202	21,237	683,674	68,197
May	540,639	20,814	969,222	49,050
June	312,021	15,887	826,534	44,771
July	263,699	14,728	889,438	47,012
Aug.	242,139	20,041	836,319	61,489
Sept.	346,068	27,958	543,740	37,071
Oct.	425,431	26,445	522,611	37,186
Nov.	646,157	27,627	556,691	26,996
11 mo.	4,839,173	235,784	6,941,439	507,368
Dec.	.....	.....	626,418	25,792
Total	.....	.....	7,567,884	553,160

U. S. IMPORTS FOR CONSUMPTION OF IRON AND STEEL PRODUCTS

Gross Tons

Articles	Nov. 1938	Oct. 1938	Jan. thru Nov. '38
Pig iron	1,493	1,174	31,851
Sponge iron	56	18	436
Ferromanganese (1)	2,571	2,281	16,792
Spiegeleisen	5,056	2,720	14,827
Ferrochrome (2)	...	...	100
Ferrosilicon (3)	69	61	679
Other ferroalloys (4)	17	...	18
Steel ingots, blooms	7	32	204
Billets	23	21	514
Concrete reinforce. bars	114	86	1,215
Hollow bar, drill steel	133	79	816
Bars, solid or hollow	1,730	1,261	17,044
Iron slabs	.....	.....	.....
Iron bars	33	5	485
Wire rods	803	415	4,800
Boiler and other plate	53	8	356
Sheets, skelp, saw plate	182	61	6,011
Die blocks or blanks	22	3	93
Tin plate, taggers' tin and terne plate	10	8	101
Structural shapes	3,798	3,279	35,768
Sashes and frames	.....	.....	.....
Sheet piling	...	235	235
Rails and fastenings	299	157	3,340
Cast iron pipe and fittings	148	104	1,373
Malleable iron pipe fit'gs	..	9	76
Welded pipe	440	822	5,367
Other pipe	1,709	2,421	21,494
Cotton ties	...	1,867	8,692
Other hoops, bands	1,658	1,079	15,296
Barbed wire	559	973	11,789
Round iron and steel wire	252	199	1,420
Telegraph, telephone wire	7	2	16
Flat wire and steel strips	302	243	2,397
Wire rope and strand	157	162	1,907
Other wire	208	114	1,386
Nails, tacks and staples	842	414	6,923
Bolts, nuts and rivets	21	30	207
Horse and mule shoes	25	40	404
Castings and forgings	81	538	3,420
Total (gross tons)	22,878	20,921	217,852
Iron and steel scrap	4,749	5,524	17,932
GRAND TOTAL	27,627	26,445	235,784

(1) Manganese content; (2) chrome content; (3) silicon content; (4) alloy content.

was spiegeleisen, 5056 tons, of which Canada shipped 4889 tons. Structural shapes were second, 3798 tons, of which 3097 tons came from Belgium. Ferromanganese was third with 2571 tons, 1949 tons from Norway.

Considering all products, Belgium was the principal supplier, with 6837 tons, including the 3097 tons of shapes, 1192 tons of hoops and bands, and 1148 tons of bars. Germany shipped 3283 tons; Norway 2087 tons, Sweden 1651 tons, France 1639 tons, and the Netherlands 1500 tons.

Steel and iron scrap imports totaled 4749 tons, compared with 5524 tons in October, and 3011 tons in November, 1937. Canada forwarded 3011 tons. Scrap imports for 11 months in 1938 totaled 17,932 tons, valued at $214,591, compared with 80,952 tons, valued at $1,140,020, in the corresponding period of 1937.

ORIGIN OF NOVEMBER IMPORTS

Gross Tons

	Iron ore	Pig iron	Manganese ore	Ferromanganese
Sweden	13,983	150	.....	.....
Norway	7,089	.....	.....	1,949
Brazil	6,850	.....	3,871	.....
Cuba	21,000	.....	4,137	.....
Chile	129,800	.....	.....	.....
Australia	19,038	.....	.....	.....
Netherlands	.....	1,158	.....	264
Canada	.....	36	.....	.....
British India	.....	149	923	.....
Soviet Russia	.....	.....	4,716	.....
Gold Coast	.....	.....	9,831	.....
France	.....	.....	.....	81
Czechoslovakia	.....	.....	.....	277
Total	197,760	1,493	23,478	2,571

	Sheets, skelp and sawplate	Structural steel	Steel bars	Hoops and bands
United Kingdom	6	...	26	1
Belgium	27	3,097	1,148	1,192
France	138	645	278	344
Germany	5	38	192	121
Sweden	5	.....	75	.....
Canada	1	.....	7	.....
Mexico	.....	18	.....	.....
Czechoslovakia	.....	.....	4	.....
Total	182	3,798	1,730	1,658

Useful in Industry?

■ A new process of multiple flash, ultra-speed photography, developed for use in sports by A. G. Spalding & Bros. and Dr. Harold E. Edgerton & Arthur D. Little Inc., Cambridge, Mass., is said to have important industrial applications. In demonstration with a swinging golf club, this composite photograph was produced by recording consecutive pictures at intervals of 1/100 second with exposure of 1/100,000 second each. Speed of moving objects is effectually "stopped" at much shorter intervals than heretofore, permitting examination of mechanical characteristics

97 Per Cent Vote in Weirton Elections

■ More than 97 per cent of eligible employes cast ballots in a recent primary and election of employe representatives, Weirton Steel Co., Weirton, W. Va. Of the total 9303 eligible employes, 9072 voted.

In the primary, 90 candidates were selected from 637 aspirants. In the election, 45 representatives were chosen. Thomas J. Long was re-elected general chairman.

Accidents Cut 54 Per Cent

■ Reduction of 54 per cent in accidents in 1938 among employes in all plants of American Rolling Mill Co., Middletown, O., is announced by C. H. Murray, assistant to the president. "The records show a marked decrease in every plant," he said. "Our Zanesville, O., plant went through the year without one accident".

Sharp Gains in Ship Construction

■ SHIPBUILDING in coastal yards will be active in 1939 with work under way and with additional work from the navy, maritime commission and some private interests in prospect, according to the annual summary by the National Council of American Shipbuilders.

The council reports a sharp gain in tonnage under construction at year's end. On Dec. 31, 59 privately owned steel vessels (1000 gross tons or over) totaling 534,004 tons, and 38 government vessels, aggregating 207,700 displacement tons, were building. This compares with 32 private vessels, with 235,250 gross tons, and 36 government ships, with a total of 143,680 tons, under construction Dec. 31, 1937. Increase in private ship tonnage was 122 per cent; in government ships, 44 per cent.

Private ships placed last year totaled 55, with gross tonnage of 482,204, against 21 totaling 170,820 tons in 1937. Fifteen government ships, with total tonnage of 136,920, were placed in 1938, compared with eight, with 26,440 displacement tons, in 1937.

Delivered in 1938 were 28 private vessels, aggregating 183,450 gross tons, and 13 government ships, with a total of 72,900 displacement tons. Deliveries in 1937 included 19 private vessels, totaling 124,660 gross tons, and 11 government ships, with 43,690 displacement tons.

First cargo vessels for transoceanic trade in 15 years were placed last year.

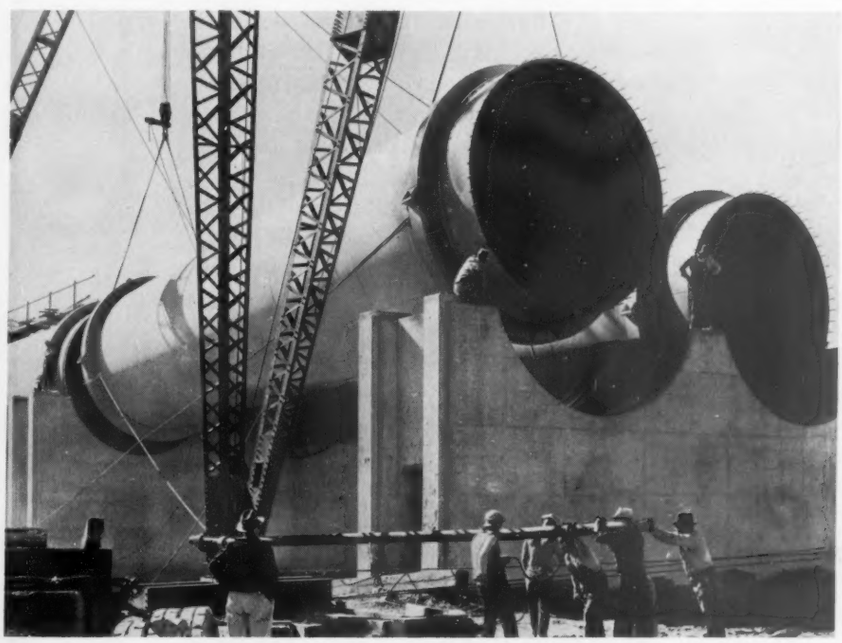
Lloyd's register reveals keels for 73 merchant vessels (100 tons or more) were laid in the United States during the first nine months of 1938. These totaled 257,485 gross tons, or 13.2 per cent of world shipbuilding for the period. United States ranked fourth in world ship construction. Great Britain was first with 21.2 per cent of total tonnage; Germany second with 18.9 per cent; Japan third with 14.9 per cent.

Welding Gains

Great Lakes and inland river shipbuilding was at a reduced rate during 1938, although the last half saw some improvement in river construction. Conditions for river shipbuilding for the first half this year are more favorable than in the corresponding period in 1938, the council reports.

Use of welding continued to increase in 1938. In construction of barges and other small craft and on interior work in larger craft, the council declared welding now is generally considered the rule rather than the exception.

Steel Carries Irrigation Canal Over River



■ **Cranes lower into place a 42-ton section of 15½-foot diameter pipe which will carry the All-American canal across New River, near Calexico, Calif. The siphon is one of the principal engineering features of the 80-mile irrigation canal, which is being constructed by the bureau of reclamation. NEA photo**

Republic Expands Gadsden Mills

■ IMPROVEMENTS costing several million dollars are nearing completion in Republic Steel Corp.'s Gadsden, Ala., plant. They include two new open-hearth furnaces, an ingot-mold yard and stripper building, extensions to the sheet mill that increase its capacity from 6000 to 9000 tons per month, a new two-story office building, and a new bolt and nut factory, largest in the South.

The open hearths are 150-ton units, increasing total open-hearth ingot capacity from 28,000 to 50,000 tons per month. A 7½-ton floor charging machine was installed, also a 75-ton hot metal crane over the charging floor. Over-all extension of the open-hearth building is 264 feet. The new ingot-mold yard and stripper building is 55 x 312 feet. On the pit side of the open hearths a 210-ton crane and additional slag car equipment have been installed.

Hot-Mill Train Extended

The improvements in the sheet mill make available a complete line of products including black, blue, and galvanized sheets. The hot-mill train was extended with the installation of a 3-high roughing mill to replace one of the old 2-high stands, and two new 2-high finishing stands. Necessary feeder and catcher tables were added. The new hot-mill motor drive is an 1800-horsepower gear unit.

Two pack-heating furnaces were added to feed the new 2-high mills. They are double-chamber type furnaces, each 55 feet long. At the last hot mill stand a return conveyor was built to take packs from this mill directly to the back of the furnaces for final pass.

The four stands in the cold mill were moved to the east end of the box-annealing building, and provided with an independent motor drive. A second pickling unit, a latest type galvanizing machine, and a new scrubber and dryer also were installed.

The bolt and nut plant is equipped to produce a complete line of building, carriage and machine bolts from 3/16-inch to 1½ inches. Total bolt-making capacity is 1000 tons per month.

The new bolt building, the first wing of which houses the forge shop, is designed to cover eventually 200,000 square feet.

The sheet mill warehouse was extended 144 feet, and six other mill buildings were enlarged in the improvement program.

Editorial

Needed: Business Men in Politics

■ SUPERIMPOSED on the brighter prospect for industry in general in 1939 is an even brighter one for the manufacturers of materials handling equipment. This is because the normal trend toward greater efficiency has been stimulated by the many new rules which now govern business. The situation is well understood by materials handling equipment manufacturers who commented on business prospects in the Jan. 2 issue of STEEL.

"Present conditions take more and more cost factors, such as wage rates, hours of work, taxes, etc., out of the hands of management and put them into the class of uncontrollable expense items," says a builder of cranes and hoists. "This means that more and closer attention must be given to remaining factors affecting controllable costs. In most plants, one of the principal items is the cost of handling material in process and finished goods. No plant manager can afford to overlook the savings possible by installing modern materials handling equipment."

Wage-Hour Law Forces Use Of Mechanical Devices

Another manufacturer also predicts even greater tendency toward mechanical handling, saying: "The year 1939 will be a promising one in the materials handling field. The wages-hours law has completely reversed the labor situation in the South. Manufacturers there already are considering installation of modern materials handling equipment, as it is most essential to keep their costs down to a point where they can operate successfully."

Another manufacturer says: "Mechanized handling will become increasingly popular during the coming year for the simple reason that it offers the most effective solution to management's two most troublesome problems—low-cost production and profitable use of man-power. Mechanical methods of moving goods not only reduce handling costs but also release skilled labor for profitable production.

Efficiency in production lowers costs and permits wider distribution of manufactured products, with a corresponding elevation in our standard of living. Competition sees to it that the inefficient manufacturer does not stay in business very long. Under this system this country's progress over many decades was the most rapid that had ever been seen anywhere in the world. There were many depressions—some of them characterized by a close approach to chaos, but there always followed a rise to heights not previously known.

New Business Rules Tend To Reduction of Jobs

The unfortunate feature today is that new curbs to business make it doubly necessary to eliminate all wasteful practices at a time when these same curbs discourage expansion and the launching of new business enterprises. Thus, there is a greater trend toward mechanization of work at a time when new jobs are being created in minimum numbers.

Under present conditions, businessmen can be of greatest help to themselves and to the country by taking an active part in politics. Admitting that business needs a certain amount of government regulation, it should be of a helpful rather than restricting character. The laws that govern business should be aimed primarily at stimulating business and industrial expansion. They should encourage the hope of profits. Only by laws drafted in this spirit can the drift toward more unemployment be stopped.

Businessmen can give vast impetus to the solution of our problems. And unless they dedicate themselves whole-heartedly to this objective these problems are bound to become constantly more serious.

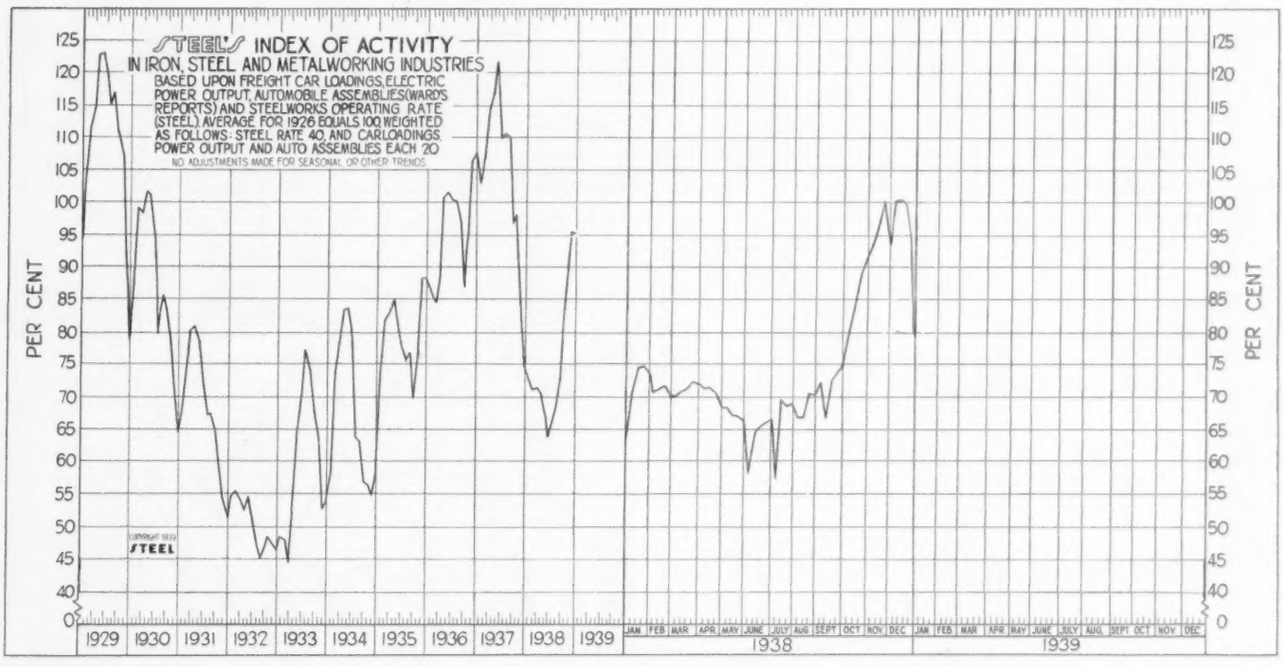
The BUSINESS TREND

Activity Index Reflects Holiday Interruption

■ REFLECTING the normal seasonal pattern STEEL'S index of activity recorded two consecutive declines for the weeks of the year-end. The index stood at 99.8 for the week ended Dec. 17 (the last week of 1938 unaffected by the holidays), eased to 94.8 in the week ended Dec. 24, and receded further to 80 in the week ended Dec. 31. A year ago at this time the index stood at 62.7.

Contributing to the decline of 14.8 points in the index for the week ended Dec. 31 were losses in all four barometers from which the index is composed. Steelmaking operations eased more than usual during the last week of the year in recording a loss of 12 points to 40 per cent. The closest recent year-end comparison was the decline of 10 points to 24 per cent during the week ended Dec. 27, 1930. However, an encouraging rebound in the national steel rate to approximately 50 per cent is anticipated for the week ended Jan. 7. Steelworks operations are expected to be sustained around 50 to 55 per cent through most of January with no real improvement anticipated until late in the month when automobile interests are expected to come into the market for comparatively large tonnages.

Automobile assemblies during the week ended Dec. 31 declined 17,675 units to 75,215, but still remained approximately 50 per cent above the 49,550 cars produced in the corresponding week in 1937. Assemblies are expected to fluctuate between 75,000 and 80,000 units week-


STEEL'S INDEX OF ACTIVITY
IN IRON, STEEL AND METALWORKING INDUSTRIES
BASED UPON FREIGHT CAR LOADINGS, ELECTRIC POWER OUTPUT, AUTOMOBILE ASSEMBLIES (WARD'S REPORTS) AND STEELWORKS OPERATING RATE (STEEL). AVERAGE FOR 1926 EQUALS 100. WEIGHTED AS FOLLOWS: STEEL RATE 40, AND CARLOADINGS, POWER OUTPUT AND AUTO ASSEMBLIES EACH 20
NO ADJUSTMENTS MADE FOR SEASONAL OR OTHER TRENDS
PER CENT
125 120 115 110 105 100 95 90 85 80 75 70 65 60 55 50 45 40 0
1929 1930 1931 1932 1933 1934 1935 1936 1937 1938 1939
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC
1938
1939
STEEL

STEEL'S index of activity declined 14.8 *points to* 80.0 *per cent in the week ended Dec.* 31:

Week ending	1938	1937	1936	1935	1934	1933	1932	1931	1930	1929
Oct. 22	88.7	97.5	97.1	82.4	58.2	60.9	48.7	58.2	77.4	104.8
Oct. 29	91.4	95.7	99.1	86.4	56.3	58.0	48.3	55.9	72.5	102.5
Nov. 5	93.4	92.3	102.1	88.4	55.0	52.3	48.5	56.0	71.5	98.1
Nov. 12	95.9	86.5	107.9	88.8	54.9	50.7	47.7	55.5	73.0	91.6
Nov. 19	100.4	84.9	109.9	90.9	55.2	52.6	49.2	54.8	71.0	87.8
Nov. 26	93.9	72.7	105.2	86.0	54.4	55.4	44.5	51.4	66.9	80.9
Dec. 3	100.1	81.5	108.4	91.7	51.9	49.7	45.3	52.9	69.2	85.0
Dec. 10	100.7	80.5	113.9	91.8	56.8	52.6	46.6	53.1	68.2	83.4
Dec. 17	99.8	79.4	114.8	91.9	60.6	56.0	49.3	52.3	67.3	79.7
Dec. 24	94.8	69.5	93.3	77.3	64.4	58.0	46.9	46.8	52.3	64.9
Dec. 31	80.0*	62.7	96.6	78.2	60.8	53.7	42.9	48.8	58.5	74.3

*Preliminary.

ly through January, with total production estimated between 300,000 to 325,000 cars for the period.

Revenue freight carloadings of approximately 503,000 cars during the week ended Dec. 31, represents a decline of 71,462 from the 574,462 loaded in the preceding week and compares with 457,359 in the identical week last year. Electric power consumption also declined to 2,120,555,000 kilowatt-hours from the all-time peak set in the previous week of 2,362,947,000 kilowatt-hours.

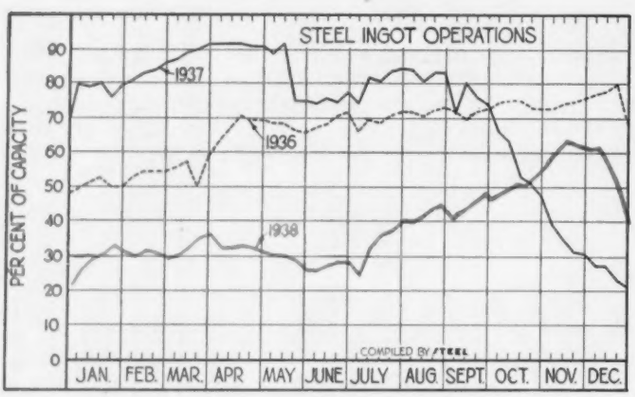
Industrial leaders are looking forward to substantially better levels of activity for the coming year. Hope of prolonged recovery in 1939 rests chiefly in improvement in the heavy goods industries, with the greatest reliance being placed on the building industry. The railroads and utilities are also expected to play an important role in bolstering general activity.

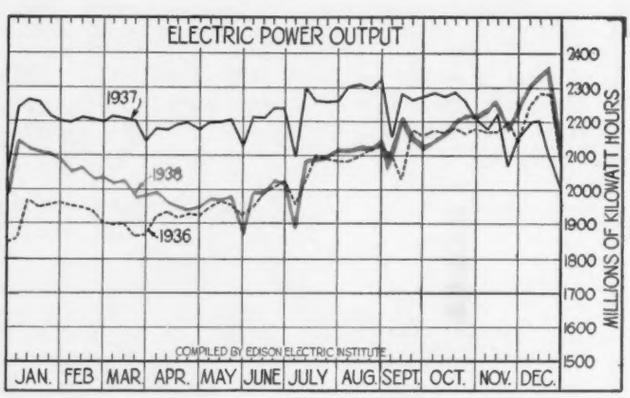
INDUSTRIAL PRODUCTION IMPROVES

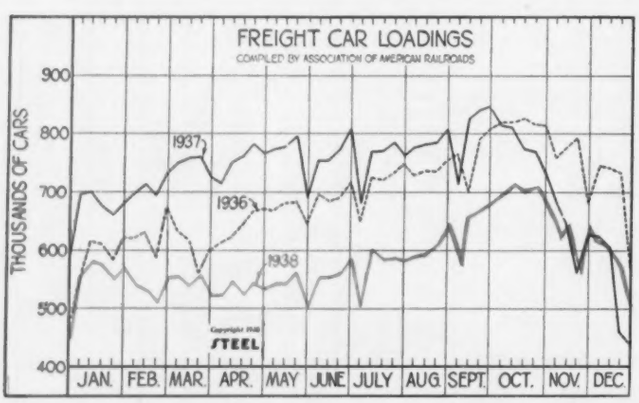
Volume of industrial production showed the sixth consecutive monthly increase during November, according to the Federal Reserve board's seasonally adjusted index. An increase during November of 7 points to 103 per cent of the 1923-1925 average not only forced the index into new high levels for last year, but also exceeded for the first time the comparable month during 1937. Employment increased in November and payrolls showed little change, although a decline is usual during that period. Distribution of commodities to consumers also increased during November. However, preliminary reports for the first three weeks of December indicate some slowing down in industrial production, a normal seasonal development.

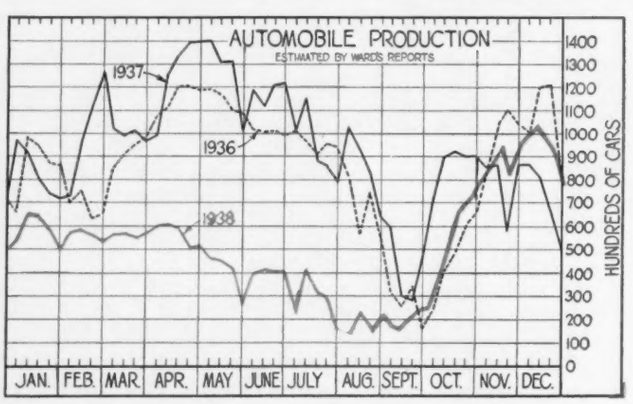
NOVEMBER AUTO OUTPUT UP SHARPLY

Production of automobiles including passenger cars and trucks in the United States and Canada, totaled 390,350 cars during November, exceeding the corresponding month in 1937 for the first time last year. The November total assemblies of 390,350 units compares with 215,296 in October and 376,629 cars produced in November, 1937. Early estimate of total production during December of 412,000 units would indicate that automobile assemblies during the 1938 calendar year aggregated 2,660,681 units. This represents a sharp decline from the 5,016,437 cars produced in 1937 and 4,616,274 units assembled in 1936. However, the outlook is considerably brighter for 1939, with most estimates predicting an increase of between 30 and 35 per cent in total production.



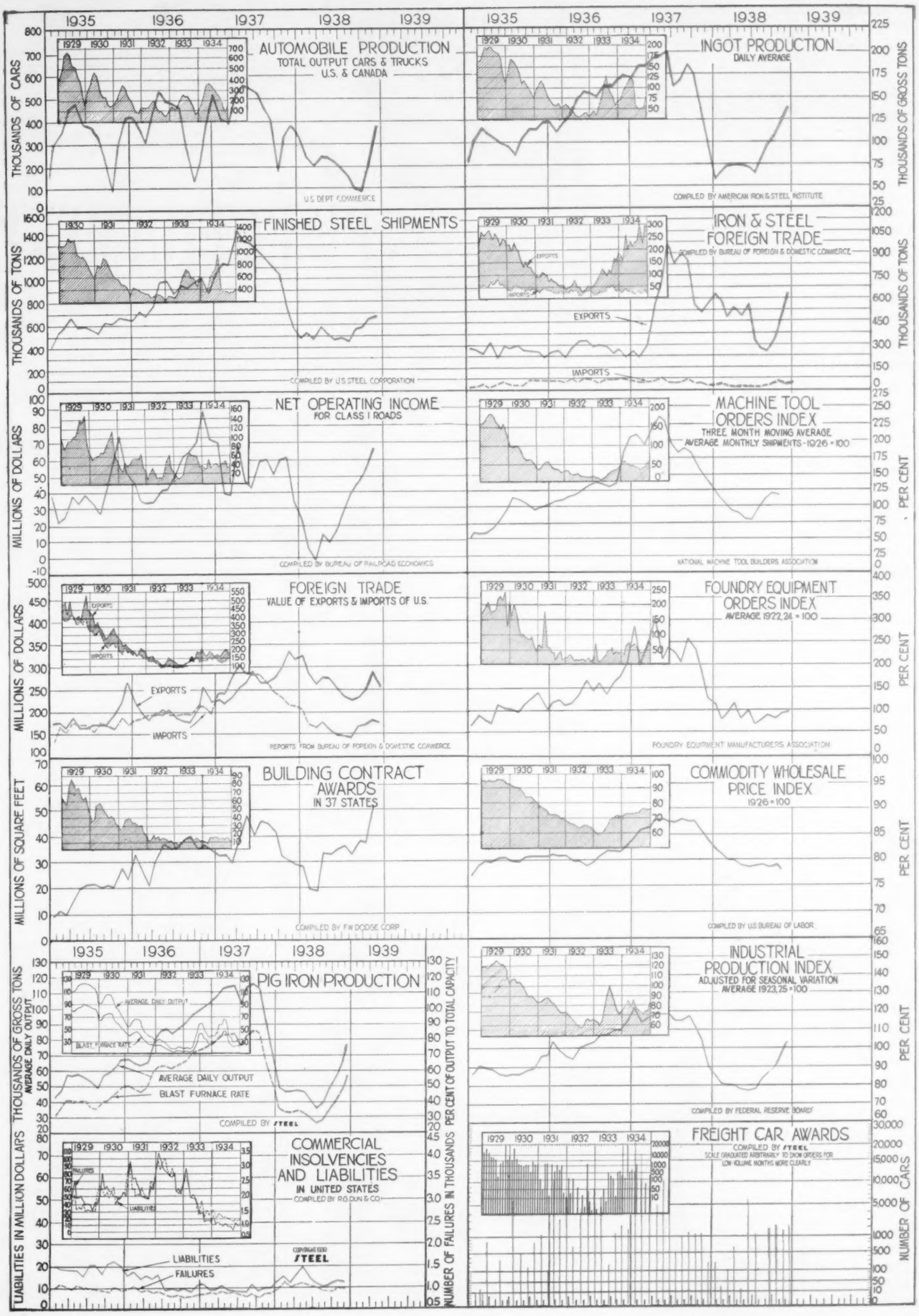




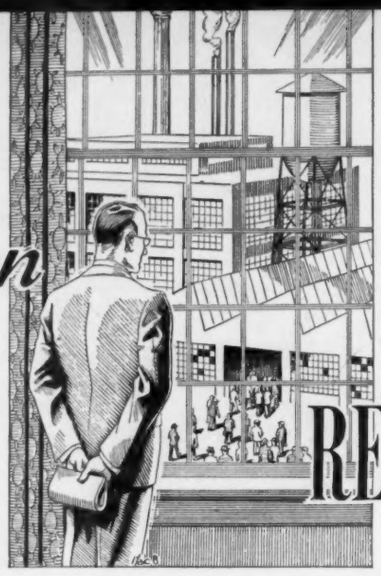


Week ending	Steelworks Operating Rate Per Cent 1938	1937	1936	Electric Power Output Million KWH 1938	1937	1936	Freight Car Loadings 1938	1937	1936	Weekly Auto Output 1938	1937	1936
Sept. 24	48.0	76.0	73.0	2,154	2,265	2,157	675,553	840,446	807,070	20,390	28,030	15,680
Oct. 1	47.0	74.0	74.5	2,139	2,275	2,169	697,938	847,245	819,126	25,405	45,830	22,800
Oct. 8	48.5	66.0	75.0	2,154	2,280	2,168	702,964	815,122	820,195	37,665	71,958	39,945
Oct. 15	51.5	63.0	75.0	2,182	2,276	2,170	726,612	809,944	826,155	50,540	89,680	48,195
Oct. 22	51.5	53.0	73.0	2,214	2,281	2,166	705,628	773,353	815,972	68,360	91,905	59,740
Oct. 29	54.5	51.0	73.0	2,226	2,254	2,175	708,840	771,655	814,175	78,335	90,155	66,985
Nov. 5	57.5	47.0	73.0	2,207	2,202	2,169	673,333	732,145	759,318	80,030	89,770	84,305
Nov. 12	61.5	39.0	74.0	2,209	2,176	2,169	636,710	689,614	784,672	86,300	85,325	104,248
Nov. 19	63.0	35.0	74.5	2,270	2,224	2,196	657,477	647,251	790,500	96,735	85,757	110,160
Nov. 26	62.0	31.5	75.5	2,183	2,065	2,133	562,084	558,627	679,984	84,930	58,955	104,283
Dec. 3	61.0	30.5	76.5	2,285	2,152	2,243	649,086	623,337	744,957	97,795	86,173	100,395
Dec. 10	61.0	27.0	77.5	2,318	2,196	2,278	619,340	622,131	738,747	100,705	85,765	119,455
Dec. 17	58.0	27.0	79.5	2,332	2,202	2,274	606,314	603,292	729,696	102,902	82,025	121,038
Dec. 24	52.0	23.0	68.0	2,362	2,085	2,080	574,462	460,367	562,218	92,890	67,230	79,019
Dec. 31	40.0	21.0	79.0	2,120	1,998	2,069	503,000*	457,359	587,953	77,415	49,550	71,800

*Preliminary.


AUTOMOBILE PRODUCTION
TOTAL OUTPUT CARS & TRUCKS U.S. & CANADA
U.S. DEPT COMMERCE
INGOT PRODUCTION
DAILY AVERAGE
COMPILED BY AMERICAN IRON & STEEL INSTITUTE
FINISHED STEEL SHIPMENTS
COMPILED BY U.S. STEEL CORPORATION
IRON & STEEL FOREIGN TRADE
COMPILED BY BUREAU OF FOREIGN & DOMESTIC COMMERCE
EXPORTS
IMPORTS
NET OPERATING INCOME
FOR CLASS I ROADS
COMPILED BY BUREAU OF RAILROAD ECONOMICS
MACHINE TOOL ORDERS INDEX
THREE MONTH MOVING AVERAGE
AVERAGE MONTHLY SHIPMENTS-1926 = 100
NATIONAL MACHINE TOOL BUILDERS ASSOCIATION
FOREIGN TRADE
VALUE OF EXPORTS & IMPORTS OF U.S.
REPORTS FROM BUREAU OF FOREIGN & DOMESTIC COMMERCE
FOUNDRY EQUIPMENT ORDERS INDEX
AVERAGE 1922-24 = 100
FOUNDRY EQUIPMENT MANUFACTURERS ASSOCIATION
BUILDING CONTRACT AWARDS
IN 37 STATES
COMPILED BY F.W. DODGE CORP.
COMMODITY WHOLESALE PRICE INDEX
1926 = 100
COMPILED BY U.S. BUREAU OF LABOR
PIG IRON PRODUCTION
AVERAGE DAILY OUTPUT
BLAST FURNACE RATE
COMPILED BY STEEL
INDUSTRIAL PRODUCTION INDEX
ADJUSTED FOR SEASONAL VARIATION
AVERAGE 1923-25 = 100
COMPILED BY FEDERAL RESERVE BOARD
COMMERCIAL INSOLVENCIES AND LIABILITIES
IN UNITED STATES
COMPILED BY R.G. DUN & CO.
LIABILITIES
FAILURES
COPYRIGHT 1939 STEEL
FREIGHT CAR AWARDS
COMPILED BY STEEL
SCALE GRADUATED ARBITRARILY TO SHOW ORDERS FOR LOW-VOLUME MONTHS MORE CLEARLY
THOUSANDS OF CARS
THOUSANDS OF TONS
MILLIONS OF DOLLARS
MILLIONS OF SQUARE FEET
THOUSANDS OF GROSS TONS
AVERAGE DAILY OUTPUT
LIABILITIES IN MILLION DOLLARS
NUMBER OF FAILURES IN THOUSANDS
PER CENT OF OUTPUT TO TOTAL CAPACITY
PER CENT
NUMBER OF CARS

Forum on RE-EMPLOYMENT



■ THAT there is a very definite connection between the degree of prosperity of the farmer and the level of industrial employment is a fact which generally is well recognized by economists. That economic difficulties of our farmers may to a considerable degree be due to the failure of the average farmer correctly to figure the real cost of his products, is a less usual view of the situation.

This point is one of eleven brought out by Norman D. MacLeod in his contribution to STEEL's Forum which appears herewith. Mr. MacLeod is president of the Abrasive Machine Tool Co., East Providence, R. I., and a past-president of the National Machine Tool Builders' association. He speaks from years of experience as a trained engineer and one-time shop superintendent, as an artillery officer who saw active service in France during the war, as a successful industrial executive, and as a practical farmer. This background lends real weight to his statements—some of which might otherwise be construed as being those of a theorist.

Mr. MacLeod is of the opinion that our country is badly in need of several educational campaigns. One should drive home to all members of every community the value of industries to the community. Another should impress upon to working people the fact that to have a good job is a privilege not to be taken lightly, and that in the long run good jobs will come only through assurance of favorable conditions for private industries. A third should be devised to train farmers in cost determination, this as a measure toward bringing about closer parity between farm prices and prices of manufactured goods than exists today.

—The Editors

■ THERE are a number of conditions which in my belief must be eliminated or at least cleared up, and a number of constructive steps which must be taken, before real progress can be made in the direction of widespread and lasting improvement in the present highly unsatisfactory employment situation. On most of these points which I am about to bring out I have held very definite opinions for a number of years. In the light of what has taken place during these years, I am today convinced even more strongly than ever before that I am correct in my opinions.

In the first place I am convinced that something very definite must be done toward the solution of our present big "alien population" problem.

As an immediate measure I believe that—except in certain special cases—our doors should be closed to further immigration of foreigners who seek to enter the United States with less than $3000.

Secondly, I am strongly in favor of prompt elimination from state and federal offices having to do with the making and the administration of important laws and regulations affecting industry and agriculture, of all so-called "educators" who are lacking in practical business experience.

A third step which should be accomplished is the setting of a maximum limit of 25 per cent on inheritance, estate and income taxes.

Fourth—and this in my estimation is a highly important step—should be the elimination of present government competition with private business. In this connection I urge that adjustments be made in the unduly high wages now being paid to certain workers in federal arsenals, navy yards and torpedo stations. Let me remark that it is all too easy to pay these high wages when all that is necessary to maintain them is to squeeze the taxpayer just a little harder.

As a fifth measure, I am in favor of early elimination of PWA, WPA and various similar agencies of relief. There can and should be prompt return to normal competitive placing of contracts on work such as this, with properly chosen private individuals and corporations. If it is necessary for the government to continue to dole out money, let it at least be done under contracts which contain the stipulation that a minimum wage rate must be recognized.

There are plenty of really worthwhile public projects left which private contractors can thus carry out. These include the building of new roads and the thorough rebuilding of old ones; the construction of bridges and underpasses; and wholesale elimination of railway grade crossings. All of these projects will serve definitely to lower our present distressingly high accident record.

As compared with the existing state of affairs in connection with

so-called government projects, all of them could be carried out through private enterprise with a much higher degree of efficiency—at the same time giving a much wider spread of employment. Furthermore, these projects could be accomplished in the latter manner without the present loss of morale to workers.

Sixth, there should be initiated in every community an extended and intensive program of public education to drive home to everyone the fundamental importance of industry to the community.

All too frequently an industry is not appreciated until it is gone. It is much easier to hold a good one than it is to replace it—even though it may be a small one. A little civic appreciation goes a long way toward making an industry contented to remain in your community.

Job-Holders Are Privileged

Seventh—and possibly along lines somewhat parallel to the foregoing—I urge that there be undertaken a continuing campaign of intensive education to drive home to workers and their families the value of a job as the one thing which makes it possible for them all to have not only the necessities of life but also more and more of the luxuries. It is of course highly desirable to maintain good employe-employer relations, but regardless of some widespread campaigns, this is not a one-sided proposition. While it is a real privilege for any of us to have a job, the employer really has much more at stake than does the employe. Therefore the employer must get some consideration. He even deserves some credit for furnishing employment. If a few individuals did not have the fortitude to "take a chance" with their energy and ability and capital, there certainly would not be much employment nor would there be much of anything substantial upon which the government could levy taxes.

Eighth, the government itself must recognize the importance of industry. A tangible way of doing it would be prompt institution of measures to bring about certain amendments to the Wagner labor relations act which will make it more fair to employers of labor than it is in its present form.

Ninth, I would suggest the bringing about of a closer parity between farm prices and the prices of manufactured goods. To a large degree this can be accomplished through intensive education of farmers in the accurate determination of costs in their particular field of activity. This program of education can be carried out by the federal and state Departments of agriculture and through the state colleges.

It is safe to say that more than 75 per cent of our farmers actually do not know their costs. This has led and is still leading to overproduction of many farm products. This in turn leads to slumps in the prices of these products.

Norman D. MacLeod
Pres. & Gen. Mgr.
Abrasive Machine Tool Co.
East Providence, R. I.

There is, for instance, no good reason for a farmer to sell eggs at 35 cents a dozen when they actually cost him 45 cents a dozen to produce. If he is like eight out of every ten poultrymen, he sells them for 35 cents because he thinks of grain cost as the only cost factor in the production of eggs. Less production of any farm products which must be sold below cost, and concentration of the farmers' efforts upon those products which have a market at prices which will yield a profit over *all* costs, will very soon result in better products and greatly improved farmer purchasing power. As a quick result of such increased purchasing power on the part of our farmers will come increased activity in many lines of industry, which in turn will serve to increase employment—including industrial employment—over a front broader than generally realized.

As point number ten, I am favorable toward the building up of our army and navy to a condition of reasonably sound defensive strength. As a primary and tremendously important step toward adequate national defence there immediately should be thorough modernzation of our arsenals, navy yards and torpedo stations as far as their machinery and other physical equipment are concerned.

As an eleventh and final recommendation, let me add that there must be a curb on further attempts to "legislate security" without compensating provisions which will encourage continued savings on the part of individuals and continued "production of wealth" through individual effort. Lasting security will never be achieved by the present spasmodic spending of public funds. In my estimation, the continuation of such a program of spending can lead only to bankruptcy. Real security can be achieved only through maintenance of a proper balance between production of wealth and savings built up therefrom.

Tank Gets A Chromium Lining

■ **Here two arc welding operators are fastening a chromium lining in place inside a vacuum flash tower built for Atlantic Refining Co. by Chicago Bridge & Iron Co. at its Birmingham, Ala., plant. Tank is 10 feet in diameter, 16½ feet long, entirely arc welded with all joints X-rayed and the completed vessel stress relieved in accordance with Paragraph U-68 of the ASME code for unfired pressure vessels. Photo courtesy Chicago Bridge & Iron Co., Chicago**

A Steam-Electric Locomotive

New power unit marks significant advance in locomotive design. First of its type, it features automatic firing control, variable voltage acceleration, electric braking, top speed of 125 miles per hour and 700 miles between stops

■ THE UNION PACIFIC'S 5000 horsepower, steam electric, passenger locomotive just completed by General Electric Co., Schenectady, N. Y., is a unique development in railroad motive power. It is said to be the first of its kind in the world and different from any of the turbine types which have been built in European countries.

The steam-electric locomotive, as a unit, is a new type of motive power, but the various pieces of apparatus used have been thoroughly tried out and are known to be entirely reliable. The essential features include a geared turbine-electric generating unit supplying electricity for operating six large driving motors on each of the two cabs. The oil fired, steam generating equipment is essentially that used in a modern high-efficiency power plant. The turbine generating set is similar to that used for years in the propulsion of ships.

Light weight and limited space requirements on a locomotive have necessitated some modifications. The boiler uses forced circulation of water through tubes surrounding the furnace, and 45,000 pounds of steam is generated an hour to a pressure of 1500 pounds at a temperature of 920 degrees Fahr. In contrast to practice on existing steam locomotives, steam is condensed and used over again after passing through the turbine, thus requiring no additional water for running the locomotive. Additional water is required, however, for heating the passenger coaches as steam used for this purpose is lost.

A distinctive feature of the steam boiler equipment is its completely automatic operation. The engineer has but to demand more power and speed in the cab to increase the flow of fuel to the boiler. Only a few minutes are required to raise the pressure from zero to full steam pressure. This avoids long delays in putting the locomotive in service and insures economical operation when making station and other stops.

Control of the electrical equipment also is completely automatic. This enables the engineer to start the train smoothly, and by means of electric braking he can glide it to smooth easy stops. Electric braking, whereby driving motors act as generators when train is coasting, is particularly advantageous. It reduces wear on brake shoes and assures maximum safety as well as entirely eliminating the disagreeable grinding of brakes. The additional safety factor also permits maintaining faster schedules.

Each unit of the 2-cab locomotive weighs about 265 tons and consists of a complete 2500-horsepower power plant. The total rating of 5000 horsepower for this 90 foot, 2 cab unit will enable the Union Pacific to handle its heaviest standard train equipment over the entire run

One of the two dual units which make up the 5000-horsepower locomotive recently built for Union Pacific railroad. Each of the two units is a complete 2500 - horsepower power plant

from Chicago to the coast without a change of locomotives and without using a helper over the grades. This locomotive is designed to operate continually at 110 miles per hour and up to 125 miles an hour where traffic will allow.

Design features of this locomotive are its modern stream-lined shape; the use of lightweight metals for the cab construction; and the fabrication of the steel, wherever possible, by electric welding.

One of the most important features of this locomotive is the condenser equipment, which effects the condensation of all the steam used and continuously returns it to the boiler for use over again. By using distilled water, the accumulation of boiler scale and corrosion is practically eliminated so long periods of operation may be expected without any deterioration of the boiler.

Long, Continuous Runs

The economical use of fuel, as well as water, will permit continuous runs of from 500 to 700 miles without stops. This is an important factor in maintaining the fast schedules of the Union Pacific's transcontinental route.

Cabs are designed to secure the lightest possible construction consistent with the requirements of strength and rigidity. Frame employs high strength tubular steel members and aluminum cab sheets except at the streamlined nose which is welded steel throughout. Cabs are largely welded except for the aluminum sheets which are riveted in place.

To facilitate maintenance, any unit of the power plant or electrical equipment, including the main boiler, can be replaced in a few hours. Traction motors may be removed in a drop-pit, other equipment by crane through the roof.

Each cab encloses a complete 2500 horsepower, geared, turbine driven, generator set; a high-pressure steam boiler; a compactly built turbine-driven auxiliary set with full automatic control; and a finned tube, air cooled condenser with turbine driven fans for cooling.

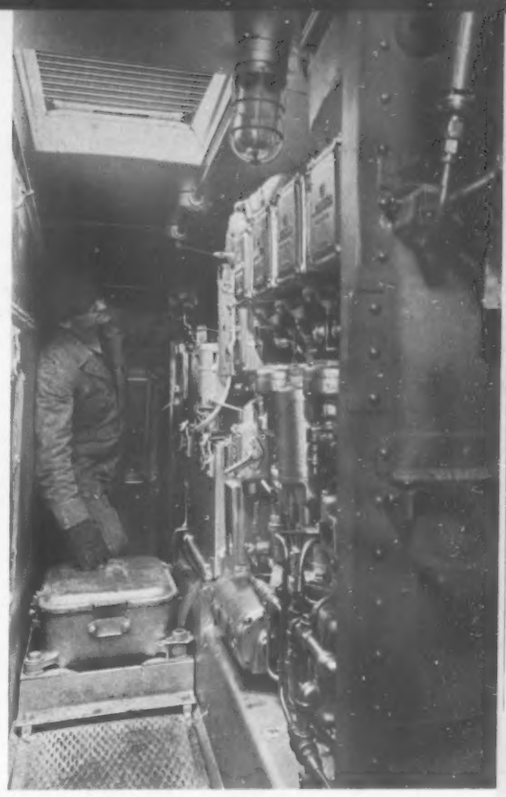
This locomotive employs provision for electric braking of sufficient capacity to hold trains on grades and to assist in making service stops. Many other features are incorporated to effect operating economies, simplify operator's duties, lengthen cruising radius and reduce maintenance cost. This new Union Pacific locomotive is particularly adapted to lines where full electrification is not justified but where superior passenger schedules are demanded.

Main boiler is a water tube, forced circulation type, compactly built, incorporating a furnace, superheater, economizer, air preheater and burners for Bunker C fuel oil.

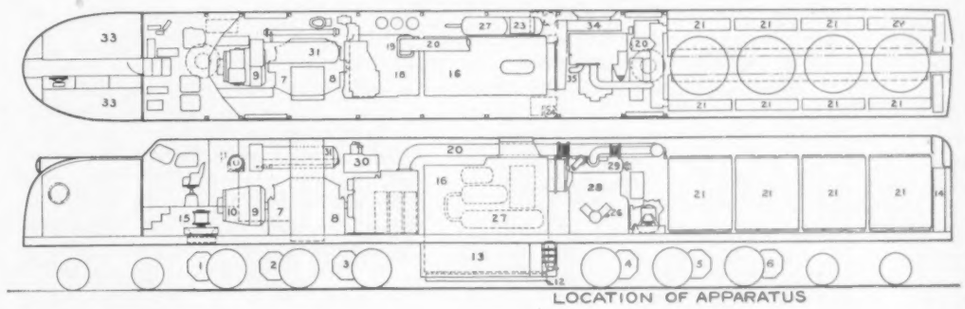
For starting the locomotive when cold, a small vertical fire-tube boiler with a capacity of 100 pounds of steam per hour is provided, using propane gas for fuel. This boiler supplies steam to heat fuel oil and to atomize the oil at the burners when starting the main boiler. Auxiliary boiler operates at 75 pounds per square inch. Where steam can be secured at a roundhouse or from an external source, main boiler is started without using this auxiliary.

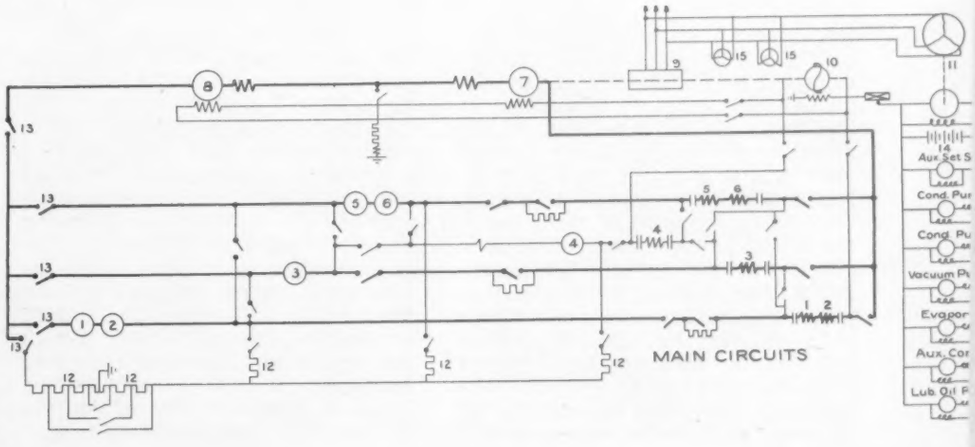
Main turbine-generator set includes high and low-pressure turbines; two armature, direct current generator driven through a 10-to-1 gear reduction from these turbines; 220 volt, 3 phase, alternating current generator connected to the main generator shaft through a flexible disk coupling; and variable voltage exciter, the armature of which is mounted on the same shaft as the alternator. This excites main generator during motoring and the traction motors during electric braking.

The condenser is mounted on each side of the rear end of the locomotive cab and consists of finned-type vertical tubes. Headers at the top receive exhaust steam from which the condensate is drained by gravity to a sump tank under the locomotive cab. Condenser is ventilated by turbine driven, propeller type fans drawing air through the sides of the locomotive and discharging it



View in cab nose showing train control equipment





Above is equipment layout, below wiring. Units are 1 to 6, traction motors; 7 and 8, main generators; 9, alternator; 10, exciter; 11, batt. chg. set; 12, braking resistors; 13, main control contactors; 14, battery; 15, traction motor blowers; 16, boiler; 18, high press. main turbine; 19, low press. main turbine: 20, exhaust header; 21, air-cooled condensers

through openings in locomotive roof.

A continuous supply of low pressure steam is required for train heating, operation of the air compressor turbine, and for heating fuel oil. For this purpose a heat exchanger, consisting of a coil immersed in raw water, takes steam either from the main boiler or by extraction from the main turbine.

Since the main generator is used solely for furnishing power to the traction motors, train speed is regulated by varying the generator voltage, thus avoiding rheostatic losses. Acceleration of the train, therefore, is effected by the well known, variable voltage system. Control current is supplied by a 125-volt motor generator set with a battery floating on the line.

Both acceleration and electric braking are regulated indirectly through the master controller which includes an accelerating handle, an electric braking handle and a reverse handle, the latter also being used as a selector handle for motor combinations in each direction. Provision is made for operating the motors in three combinations—series, series-parallel and parallel. Both the accelerating and braking handles normally hold a fixed kilowatt load on each controller step, except during the first few motoring steps where approximately constant tractive effort increments are obtained.

As power plant is entirely automatic, there are no power plant pressure or temperature gages in the operating cab. These are located on a control board in the apparatus cab. Automatic train control and cab signal equipment of the continuous type with suitable inductors for operation over Union Pacific lines are installed on both units of the locomotive.

The mechanical and electrical parts of this locomotive were manufactured in the Erie plant of General Electric Co., the boiler was supplied by the Barberton plant of Babcock & Wilcox Co., and the boiler control devices by Bailey Meter Co. of Cleveland. The locomotive is now undergoing commercial tests and upon the completion of these runs will be placed in revenue service.

Oxygen Lance Used to Drill Heavy Concrete

■ RECENTLY contractors laying a 4-inch emergency pipe line at the Liberty automobile tunnels, Pittsburgh, were stymied when they ran into a 7½-foot solid concrete wall that they originally thought to be a hollow partition. For six hours their crew of three men, using star drills and sledge hammers, chipped away at the wall and at the end of the day had only penetrated 12 inches into the concrete. In addition, the further they went the harder the work became because of the difficult and cramped positions under which the work had to be done. It appeared impossible to chip entirely through the wall even if they worked from opposing sides.

At this point they called into consultation M. R. Semmer of Air Reduction Sales Co., Pittsburgh, who had had a similar experience in dismantling a brewery where foundations 6 x 9 x 3 feet high with 12 foundation bolts embedded in each were to be removed to make space for a cold storage room. Both here and at the Liberty tunnels, dynamiting was impractical because of possible damage to nearby structures.

In burning out the foundation bolts at the brewery, Mr. Semmer had discovered that the concrete adjoining the bolts would chip off in large pieces when struck with a hammer. Temperatures required to melt iron, steel and similar metals appear to disintegrate concrete. By applying heat to the rest of the abutments, the brewery concrete foundations were quickly leveled.

The following method proved satisfactory at the Liberty tunnels job: Lancing operations were started in the wall where they had chiseled a hole about 10 inches in diameter and 12 inches deep. Into this hole, metal scrap was placed and heated with the torch to the molten stage, a temperature around 2500 degrees Fahr. The oxygen lance then furnished the additional heat required to melt additional scrap which was fed in continually. The molten metal carrying disintegrated concrete oozed like lava from the hole.

Pressure of oxygen forced out the molten metal and disintegrated concrete at a fairly steady rate. At the end of seven hours, a hole approximately 4 inches in diameter was bored through 7½ feet of concrete wall at the rate of about one foot per hour. An oxygen regulator on the tank of oxygen maintained a pressure between 50 and 60 pounds per square inch. Oxygen consumed amounted to 1430 cubic feet. Eighteen standard 20-foot lengths of black iron pipe also were used.

Machining of Metals Treated in Symposium

■ *Machining of Metals,* cloth, 177 pages, 6 x 9 inches; published by American Society for Metals; supplied by STEEL, Cleveland, for $2.50; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London, S.W.1.

This volume is a symposium of five lectures before members of the American Society for Metals at the twentieth National Metal Congress and Exposition in Detroit, Oct. 17-21, 1938.

The first lecture is by Hans Ernst, on the physics of metal cutting; others are by Harry B. Knowlton, on machinability of ingot iron, wrought iron, S.A.E. steels and stainless steels; by J. W. Bolton on factors affecting machinability of cast steel, cast iron and malleable iron; by A. H. d'Arcambal and W. E. Bancroft, on machinability of tool steels; by Harry P. Croft, on machining of nonferrous metals.

The text is supplemented by numerous illustrations and diagrams showing stresses, formation of chips, flow of metal, structure of various metals, and similar data. Various tables show comparisons among types of metals.

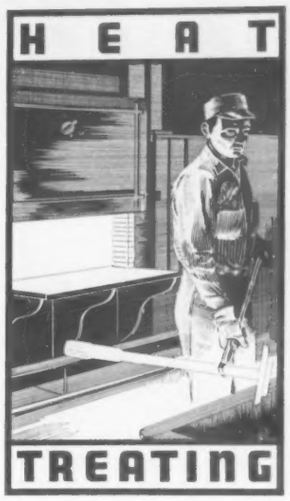
Mr. Ernst is director of research, Cincinnati Milling Machine & Cincinnati Grinders Inc., Cincinnati; Mr. Knowlton, metallurgist for International Harvester Co., Chicago; Mr. Bolton, chief chemist and metallurgist for the Lunkenheimer Co., Cincinnati; Mr. d'Arcambal, consulting metallurgist, and Mr. Bancroft, chief metallurgist, for Pratt & Whitney division, Niles-Bement-Pond Co., Hartford Conn.; Mr. Croft, chief metallurgist for Chase Brass & Copper Co., Cleveland.

Develops Highly Resistant Paint for Steel Surfaces

■ Harrington Paint Co., East Cleveland, O., announces Gvymmer, a paint which withstands rough handling and has high weather and chemical resistance on steel.

Its outstanding characteristics are: Heat resistant to 450 degrees Fahr.; inorganic acid and alkali proof; withstands mild organic acids; is anticorrosive, nonpoisonous, an electrical insulator, not affected by moisture or fumes from brine, ammonia or sulphur. In addition it is waterproof, expands and contracts with steel so is not loosened by heat or cold, does not chalk, covers 800 square feet per gallon, drying overnight. It can be used on buried steel.

A feature of Glymmer is that it leafs in the same manner as aluminum.



Annealing Stickers

Important because of increased scrap and decreased market value, production of "stickers" is shown largely dependent upon metallurgical considerations

Part I

■ EFFICIENT processing of continuous mill products is beset with numerous menaces to "quality" and "costs" at various stages of the process. In most operations, these can be corrected and controlled without impairing the general efficiency of the operation or product. In other instances, the hazard persists in spite of all corrective measures. Consequently the practical standards of efficiency of those operations are below normal.

Such a condition characterizes the production of cold-reduced sheets and tin plate in which mills frequently are obliged to grant undesirable price concessions because of the hazard of "annealing stickers."

Efficiency of the annealing operation frequently is effected when metallurgical considerations demand that the stock be treated at certain definite temperatures. While these temperatures may be beneficial to the product yet under the conditions of mass production, with sheets piled on top of one another or wrapped in coils, the characteristics of the product at such elevated temperatures promote adherence of the steel.

Sticking Increases Costs

This adherence or "sticking" condition represents added costs because an additional manual operation must be conducted to open or separate the product before it can be routed through the next operation. It also results in damaged product or scrap depending on the degree of sticking. In extreme cases, the pieces are welded to each other and if they cannot be separated they must be scrapped. In any case, opening or separating "breaks" the surface at the spots or areas affected and at best, only a secondary product results.

Sticking is more likely to occur when the product is annealed in sheets than in coils, and accordingly many plants set up their processing and equipment to anneal in coils where possible.

Most sheet mill operators have experienced difficulties due to stickers that result from annealing. The accompanying article, written by an engineer of wide experience, sets forth details of practice which have been found to minimize this problem

At some cold reduction plants, the production of stickers is not tolerated, and so metallurgical and operating concessions are made to avoid them. At other plants, stickers are taken to mean good annealing and are tolerated to a reasonable extent.

Regardless of which attitude prevails, the annealing setups must be closely regulated. This involves a restriction of the output of "primes" in that the quantity of material annealed at one time is limited by its sticking characteristics. Thus the amount annealed at any one time is never up to the rated capacity of the furnaces. Even the modern furnaces of a high degree of efficiency, thermal and otherwise, are operated on certain grades as low as one-third to one-half their rated capacity because of the sticking hazard.

Four main factors operate to cause stickers on cold-reduced stock: Temperature, soaking time, pressure and surface finish.

Apparently manipulation of these four factors, in part or in their entirety, will determine the amount, extent and degree of sticking. These factors function simultaneously and are so related to each other that it is difficult to evaluate the relative importance of each.

Efficiency of the methods of control in use at some plants is not in line with that obtained at other mills. Stickers made at some cold-reduced plants range from negligible quantities up to 6 per cent and more. Some cold-reduced tin plants show much higher normal output of stickers with peaks as high as 20 per cent where the product is processed in sheet form.

Temperature Is Criterion

A comparative analysis of the control exercised by temperatures alone is complicated by differentials because some plants use furnace temperatures, others steel temperatures and because of varying locations for thermocouples. Actual temperature of the steel should be the criterion used. On cold-reduced material this ranges from about 900 to about 1400 degrees Fahr.

Two aspects govern the specific temperatures to be used on any given product. First, metallurgical considerations require that the stock be treated at certain temperatures in this range. Second, operating considerations come into play because at these elevated temperatures the characteristics of the product render adherence of sheets and coil wraps a certainty.

The temperature element, therefore, is decisive in all its phases. If it were not, the tin mill manager's plan of meeting the requirement of a 1000-degree Fahr. anneal by loading his furnaces to the limit for two 500-degree anneals would be a feasible way to eliminate

stickers and increase production efficiency.

Comparison of the temperatures in use at competitive plants on comparative products indicates that the temperature setup is not the sole guide to freedom from stickers. Higher temperatures are used on coils than on sheets yet a smaller quantity of stickers arises in coil annealing. Similarly where higher temperatures are used on comparative sheet sizes, a smaller amount of stickers are made.

This does not infer that overheating will not cause stickers, as overheating undoubtedly contributes to sticking.

Nor does it imply that excessive temperatures are not a fruitful source of stickers. Safe and normal temperatures at one plant may be considered excessive at another. Plant setups show that despite peak annealing temperatures epidemics of stickers occurred, indicating other variables beside temperature must be controlled.

However, the net effect of the reaction between metallurgical and operating considerations focuses attention on temperature control.

At some plants, metallurgical aspects are paramount and there the interpretation of quality admits of no compromise with temperatures. High percentages of stickers are charged to and accepted in the name of quality. Other plants, in the light of their conception of quality, adjust the temperature setup to avoid stickers.

Another approach to temperature control is proving advantageous. Careful scrutiny of cold reduction operations reveals that on some grades the percentage of reduction is greater than surface and other requirements justify, necessitating the use of high temperatures with consequent high sticking hazard. A change in band size enables lower temperatures to be used. Specifically, when most single-pickle grades are lowered to 40 per cent reduction and control of temperature exercised, production is benefited.

Careful weighing of metallurgical aspects, in general, can lead to more freedom in exercising temperature control. Metallurgical aspects can be over-emphasized in the name of quality and apparently this has happened in several instances.

Metallurgical control testing formerly was based, largely, on ductility values, supplemented with hardness and stiffness tests on various specialties where deemed essential. Now control testing is based on hardness or temper rather than ductility. This enables considerable tonnage to be treated at lower temperatures with a corresponding decline in the output of stickers. With ductility as the guide, the annealing setup with high temperatures led to a high degree of grain refinement so after cold rolling the steel would meet the ductility standards.

Body and end stock subjected to this treatment left the annealing furnace soft and ductile and then had to be given considerable cold rolling or skin-passing to eliminate fluting, paneling, etc., without lowering the ductility. The change to hardness or temper control enabled the stock to leave the anneal closer to final temper thus minimizing cold rolling as well as lowering the production of stickers.

Soaking time, like temperature, is set by metallurgical considerations and tends to promote sticking in that the longer the material is held at the elevated temperatures, the greater the possibility of the other factors asserting themselves unfavorably. Therefore "the higher the temperature, the shorter the soak" makes for a lower production of stickers.

Soaking Time Varies

However, control of soaking time, like control of temperature, appears to function at the various plants directly in keeping with their interpretation of quality. A comparison shows a wide range in the soaking time on various grades in relation to temperatures used. This is reflected in high sticker output or a general slowing down of annealing operations at those plants where quality is restricted by metallurgical considerations of the product alone rather than to include also some emphasis on operating considerations. This is true especially on deep and extra deep drawing grades.

Demand for better and more uniform physical properties on these grades has led some plants to ignore limiting the soak and to attempt little, if any, control over stickers by shortening the soaking periods.

Length of the soaking period should be properly balanced with the temperature if metallurgical requirements of grain structures and physical properties and operating requirements for efficient production are to be satisfied.

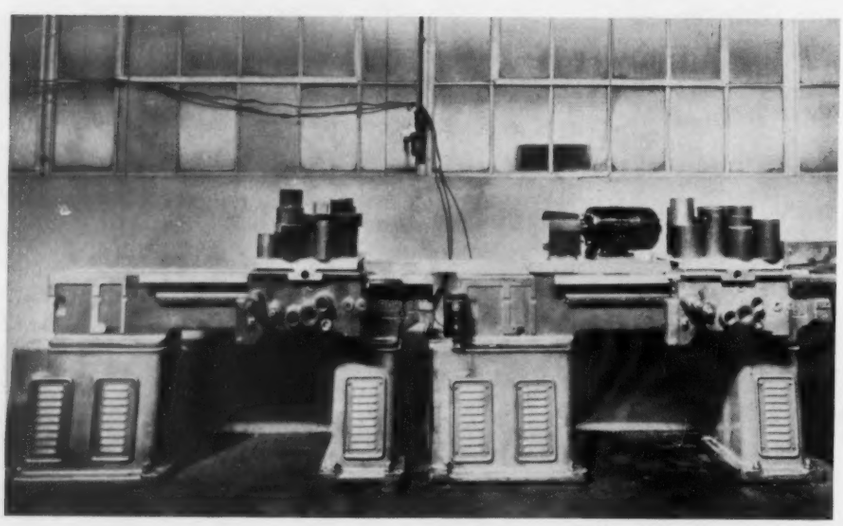
Plant investigations of heating, soaking, and cooling periods in use indicated that a better control of soaking time was essential and consequently shorter "soaks" were adopted with a measureable decrease in sticking at no sacrifice of physical properties.

These investigations indicated that, with the temperatures in use, shortening of the soaking period was advisable not only from a sticking standpoint but also from the more important aspect of ductility.

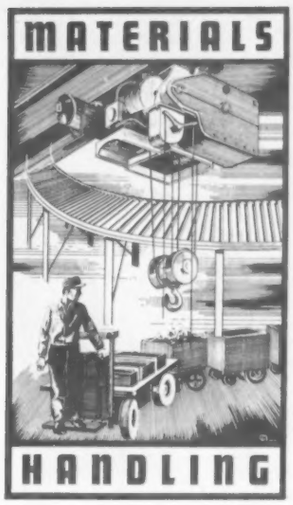
While longer soaking periods gave lower Rockwells with no apparent drop in Olsen values, tensile tests showed a dropping off in percentage elongation. The metallurgical explanation of this decrease in elongation is that during long soaking periods at prevailing temperatures, the cementite particles agglomerate into relatively large masses, whereas a more favorable structure with carbides spheroidized to less objectionable size can be obtained with a shorter soaking period.

(Concluded in Jan. 23 issue)

Hardened Bed Wears Well



■ **Two similar beds, one unhardened and the other flame-hardened and ground, were selected for this lathe bed breakdown test now in its eighth month at Monarch Machine Tool Co., Sidney, O. After more than 6,000,000 passes of the two carriages, each carrying a 500-pound weight, the unhardened bed had worn more than 0.002-inch over its entire area and showed several deep scores, but the flame-hardened bed had no measurable wear and showed no scratches**



Crane Lubrication

Better bearings with tighter seals and use of correct lubricant eliminates damage to products in process, caused by dripping of lubricants. Block greases also are a help

■ WHILE HEAVY duty steel mill equipment such as ore conveyors, charging equipment, skip hoists on blast furnaces, ladle cranes, ingot stripping and ingot charging cranes and other overhead materials handling equipment are most substantially constructed, their continued and unfailing operation may depend entirely upon proper lubrication.

Operating conditions expose overhead materials handling equipment in steel mills to high temperatures, dust concentrations and possible acid conditions in the atmosphere along with vagaries of the weather in that portion outdoors. The ability of lubricants to withstand acid, moisture, corrosive and abrasive dust depends to a large degree upon how they are applied to such equipment. Coincidental with the trend toward increased unit loads on bearings, lubrication methods and protection of bearings have been greatly improved, resulting in reduced loss of oil and grease and greater protection against oil spotting of the product during handling.

Dripping of lubricants is usually attributed to excess application, improper lubricants or carelessness in handling lubricants during application. Attention to these factors will eliminate dripping in most instances where modern equipment is used.

With older types of equipment special lubricants are available which help prevent loss. Due to the wide range in operating temperatures which prevails on much equipment and the tendency of certain types of lubricants to creep, dripping may be somewhat of a problem. High temperature has the effect of reducing viscosity and sometimes renders lubricants so fluid as to require the most carefully designed seals. For this reason the trend is toward heavier oils and harder greases. Where oil is employed, as little should be used as is commensurate with the temperature of the bearings.

Oily Dust Causes Damage

All oil and grease damage to sheet steel, however, should not be charged to drippage from cranes and overhead equipment nor to negligence of oilers. In japanning or enameling furniture or other full finished stocks, a small particle of oil saturated dust as small as a pin point falling onto the sheet after pickling will expand during enameling into a discoloration sometimes as large as a 10-cent piece or a quarter. This is due to expansion of vapors resulting when certain petroleum products are subjected to annealing oven temperatures.

Careful study of crane bearings has resulted in the conclusion that use of waste and oil can be discontinued by substitution of a pliable grease. In many plants such a procedure has virtually eliminated drippage. In some installations the grease is placed in specially designed pans and held against the journals by springs. Grease also can be kept in close contact using the weight and lever device illustrated in Fig. 1. Here a grease container, 2½ to 3 inches wide and same length as bearing, is used to insure contact of grease the entire length of bearing. Pressure is regulated by adjusting location of the weight on the lever according to operating temperatures.

Operating temperature must be considered when selecting any such grease. Where cranes run over open-hearth furnaces or annealing ovens, the grease should have a comparatively high melting point to prevent a reduction in consistency because of heat.

Grease lubrication also is practical on cranes equipped with roller bearings since usually these are more tightly sealed than plain or sleeve type bearings. A medium consistency grease of high melting point, containing an oil with viscosity of about 175 seconds Saybolt at 210 degrees Fahr., will serve effectively. The grease of course must

Abstracted from *"Lubrication"*, published by The Texas Co., New York

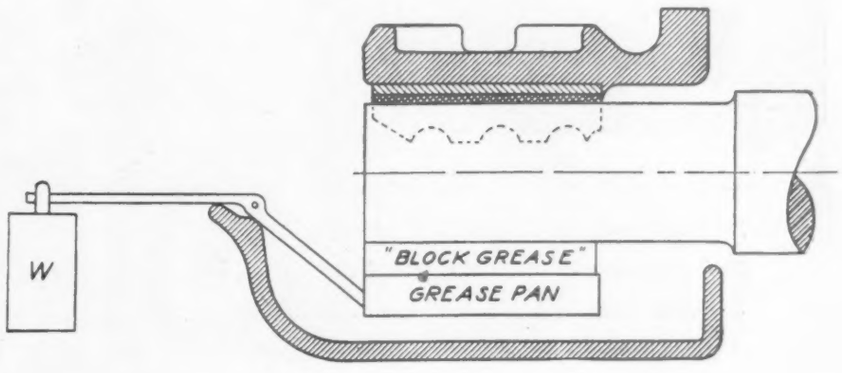


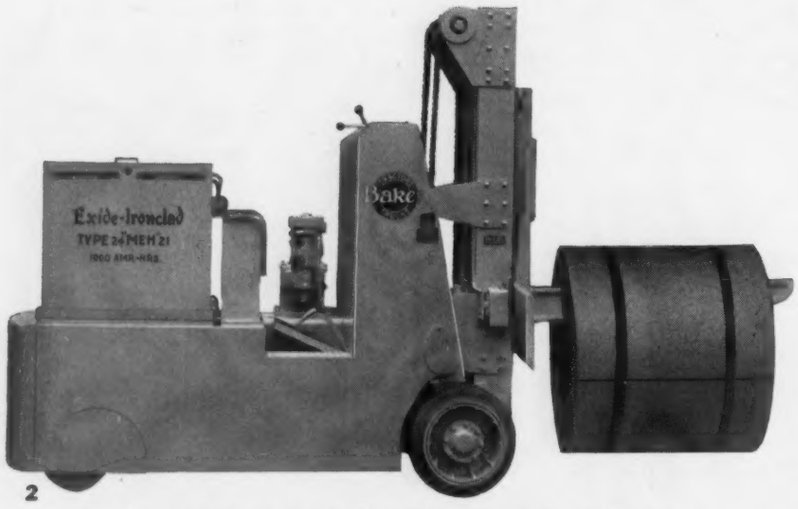
Fig. 1—This indicates arrangement where block greases are applied to crane journal bearings to overcome drippage

Go forward

. . . with Electrics and Exide-Ironclad

Exide
IRONCLAD
BATTERIES
With Exide **MIPOR** Separators
"MIPOR," Reg. U. S. Pat. Off.

1



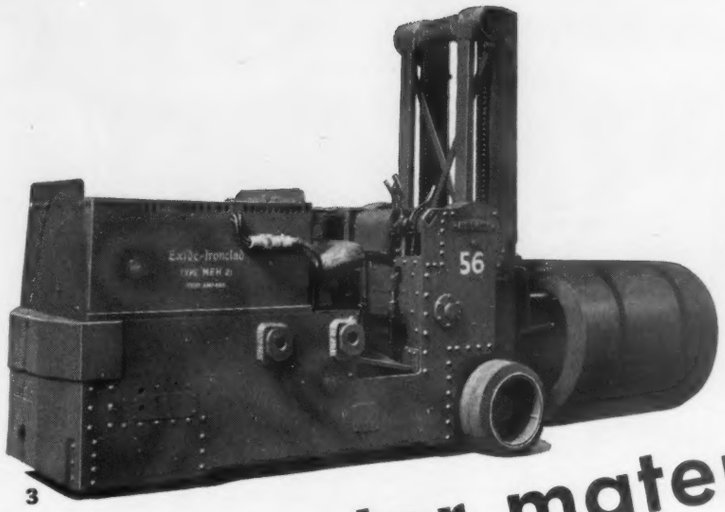
2

1—Truck made by The Yale & Towne Manufacturing Co.
2—Truck made by Baker-Raulang Company
3—Truck made by Automatic Transportation Co., Inc.
4—Truck made by The Elwell Parker Electric Company

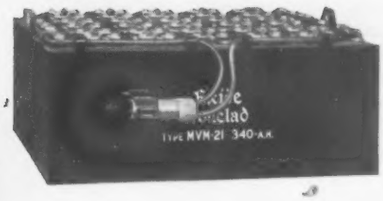
THE new year promises to be a great year for all industry—and for the electric industrial truck industry particularly, because these invaluable material handling units are broadening their value to users month by month.

1939 will undoubtedly be a big year for battery propelled trucks, because—with the development of the new and greater MEH and FLM Exide-Ironclads in steel trays—batteries are now available for every truck, including the largest.

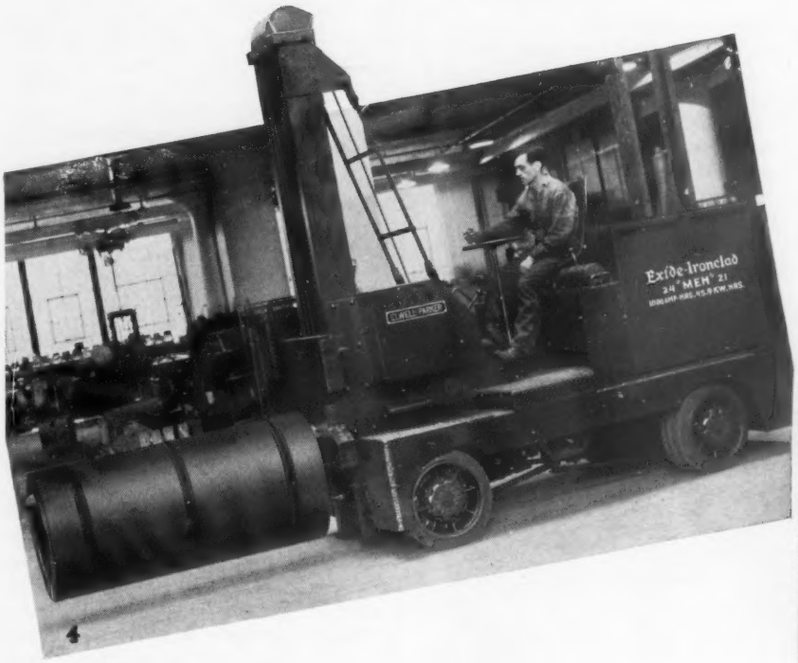
This means the same dependable and economical service day-in and day-out for all sizes of trucks on all jobs, no matter how large the truck or severe the service. And the development of a new Exide discharge



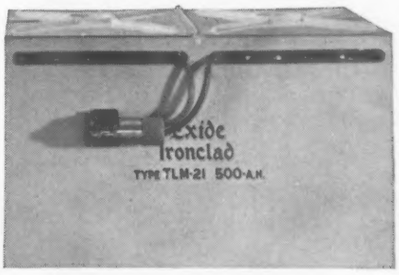
3



for greater material handling at lower cost!

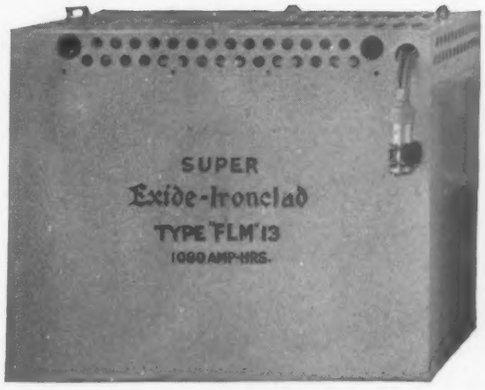


4



indicator, and the new Exide charge control unit assures better truck performance, less care and maintenance, and lower battery cost.

Start now to go forward with electric trucks powered by Exide-Ironclads and assure more dependable material handling at lower cost. Get in touch with us for full details.



THE ELECTRIC STORAGE BATTERY CO.
Philadelphia

The World's Largest Manufacturers of Storage Batteries for Every Purpose

Exide Batteries of Canada, Limited, Toronto

be readily applicable with a hand-operated grease gun.

As a general rule the same type of lubricant can be used on all anti-friction bearings on the average crane, the melting point of such a product being around 300 degrees Fahr. or higher. There should be no tendency toward saparation nor should the grease oxidize to gummy residues or separate oil.

In lubricating gears and pinions, the smaller the amount of lubricant used the less trouble is experienced. After the teeth are coated, only a small amount of lubricant is required to keep a film on them. Straight mineral lubricants are best for such service. Their fluidity, however, must be chosen carefully according to the type of housing.

Cables or wire rope with which cranes are equipped also require lubrication. In steel mill service the usual types of wire rope lubricants, however, are not always satisfactory, due to wide range of temperatures and the fact that ropes are in direct line with materials being handled. Obviously, any dripping of lubricant from the cables may reach the material being handled.

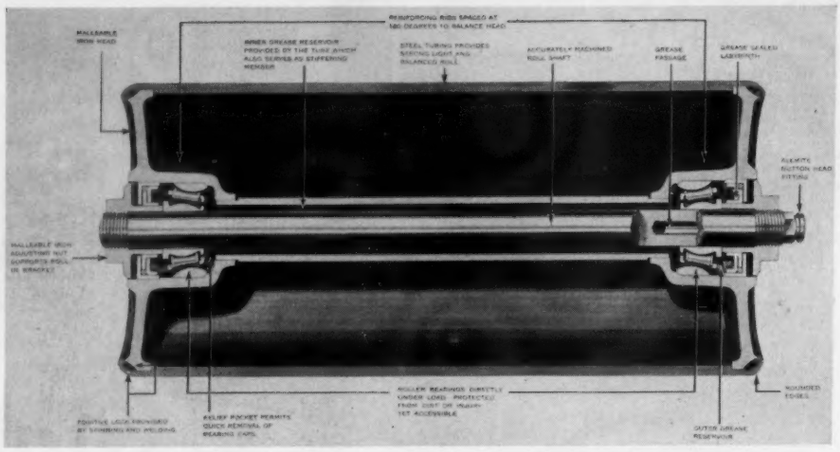


Fig. 2—Conveyor roller design for lubrication from one point. Photo courtesy Link-Belt Co., Indianapolis

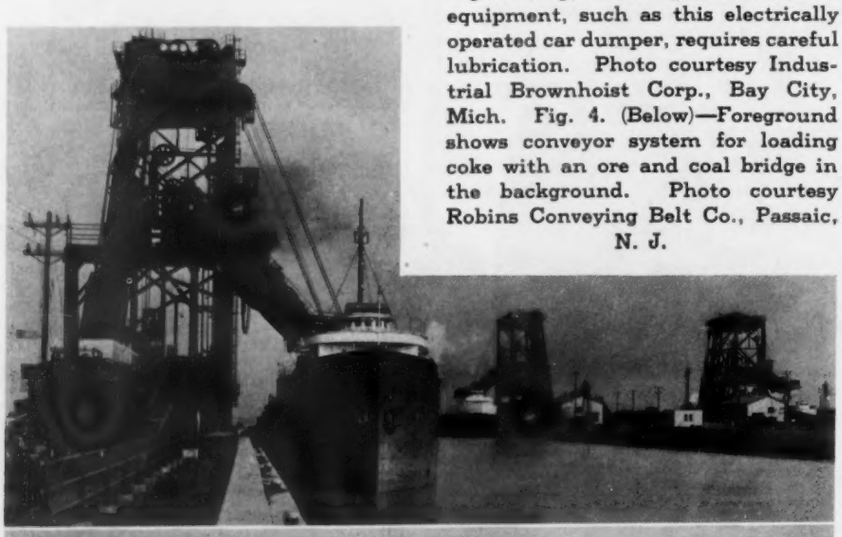
Thus best practice dictates that cores of the ropes be treated during manufacture with a lubricant of heat resisting characteristics and free from all fillers.

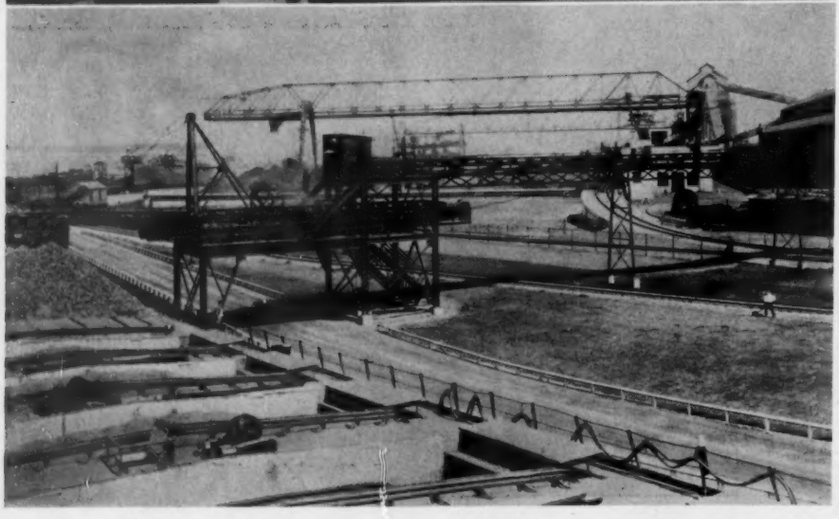
Where a rope core has been treated with a lubricant of this type, it will work its way out through the strands of the rope, not only giving additional life but preventing premature corrosion and rusting.

Sheave wheel bearings are usually of the sleeve type. They can be effectively lubricated with grease by means of a hand operated grease gun. The amount of lubricant necessary to meet such requirements is comparatively small and gun applications should be controlled carefully in order not to deliver too much lubricant. Otherwise, it might find its way out to the ends of the bearings to drip and cause considerable trouble.

Other sources of drippage are the back axles and line shafting. While these are usually equipped with an industrial grease fitting of some type, it is generally the practice of the operator to consider that if a little bit of grease is good, a whole lot will be better; as a consequence, they are often over-lubricated.

Fig. 3. (Top)—The exposed nature of equipment, such as this electrically operated car dumper, requires careful lubrication. Photo courtesy Industrial Brownhoist Corp., Bay City, Mich. Fig. 4. (Below)—Foreground shows conveyor system for loading coke with an ore and coal bridge in the background. Photo courtesy Robins Conveying Belt Co., Passaic, N. J.





Motor Bearings Over-Lubricated

Motor bearings also may cause similar trouble. If the cavity for lubricant is filled to excess there is bound to be a drippage and likely damage to the product. Care should be taken in selecting lubricant for these bearings, as well as its application. In most cases dripping is due to the tendency to keep motor bearings clean by flushing out with excess lubricant, and the desire of the workman to prevent hot bearings and avoid criticism. The same holds true in connection with anti-friction bearings using grease. Here, however, the judicious use of vents will serve as a preventative of over-lubrication.

Centralized lubrication has been given considerable thought and time by manufacturers, as centralized lubricating equipment once installed and properly adjusted assists greatly in overcoming the problem of dripped lubricants from overhead equipment.

Belt conveyors in handling ore

and fuels are generally used at fairly low temperatures, hence lubrication does not involve the wide range in temperatures encountered in crane operations. Conveyor design has turned largely to use of ball or roller bearings. With study of pressure lubrication, bearing seals and methods of grease application are designed for least possible servicing with maximum ease of relubrication. Since it is obvious that relubrication of thousands of roll sets in large conveyors may be slighted if it involves much trouble, entire roll sets are now lubricated from one point with provision for suitable ducts to the various bearings in the roll.

The problem of high dust content and dilution of grease with abrasive matter is solved by charging a bearing lubricating system at regular intervals with sufficient pressure built up from within to prevent entry of abrasive or coercive foreign matter. Ore bridge and unloader lubrication is essentially a matter of counteracting the effects of detrimental weather conditions by use of oils, greases and wire rope compounds especially capable of protecting the wearing elements of the equipment.

Lubricants Must "Take It"

These lubricants should be selected with utmost care since in most cases they will be called upon to function in the open, subjected to widely varying temperature conditions and sometimes in the presence of rain, snow and ice. Furthermore many of the wearing elements to be lubricated will be located in more or less inaccessible or hazardous positions and so may be neglected.

On such materials handling equipment, provisions for enclosed lubrication are usually impractical so lubricants must give maximum protection.

Motor driven car dumpers and unloaders necessarily involve massive construction. In consequence the heavy loads placed on gears and bearings present an unusual responsibility to the operator in correctly lubricating the equipment. Loads connected with handling 70 or 90-ton gondola cars impose a duty on bearings and gear teeth which in other industries would be considered prohibitive. Here lubricants must be so refined as to maintain a lubricating film capable of resisting any squeezing out action. Also they must possess adequate fluidity to function under low temperature conditions. Since such equipment is frequently operated below freezing temperatures, due regard must be given to pumpability when selecting lubricating oils, greases and gear compounds for this type of outdoor service.

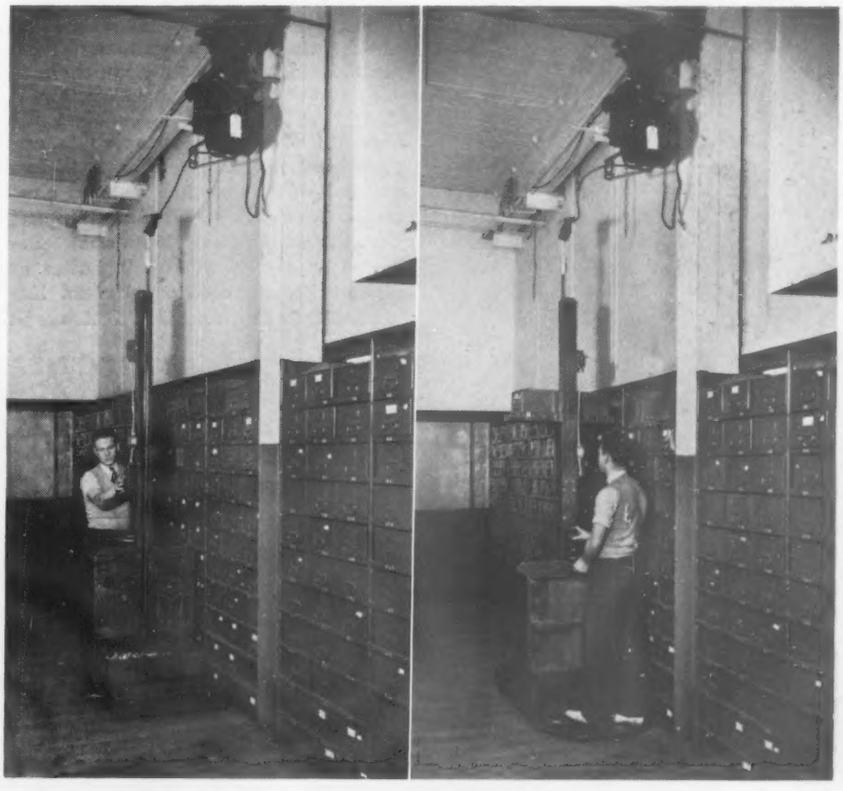
Special Truck Lifts Tote-Boxes

■ A SMALL, 4-wheeled truck, equipped with a rollered elevating platform that lifts loaded tote-boxes into place in the stock rack, has been developed by General Electric engineers to reduce handling costs and contribute to safety in a large stockroom of the company's West Lynn, Mass., plant.

Boxed screw machine parts in tote-boxes, arriving in the stockroom on a conveyor from the plating and cleaning department, are slid one at a time to rollered surface of the truck platform from their position on the conveyor. Truck then is moved under its own power to the proper stock rack, where box is rolled to position on the shelf. When it is desired to take parts out of stock, the same truck lifts boxes from storage racks and puts them on trailers, bound for assembly lines in the West Lynn meter department.

Servicing a floor area of 2000 square feet, the truck has a capacity load of 1000 pounds. Tote-boxes, which are 12 inches wide, 24 inches long, and either 6 or 12 inches deep, weigh from 200 to 400 pounds loaded. The truck can lift to eight feet, three inches higher than the top row of shelves in the storage rack. Unit is 4 ft. 9 in. long and 2 ft. 3 in. wide. A ¾-horsepower motor lifts the load. Electric power is supplied by cable from a fixed outlet.

Safety is a principal feature of this truck which is used to lift loaded tote-boxes in stockroom

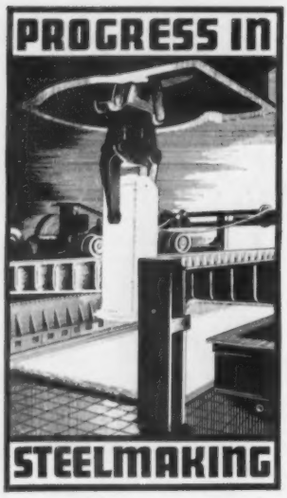


Test Adhesion Qualities In Tinplate Fabrication

■ It is pointed out in technical publication A 79 of the International Tin Research and Development council that tin plate has certain advantages as a basis material for fabrication after plating. Its surface luster is high, little preparation is needed to obtain a good finish, and it can be stored without rusting.

As it is essential that plated coating be sufficiently adherent to withstand complex stress imposed during fabrication, work has been sponsored by the council at Woolwich, England, to determine factors affecting adhesion. It has been found that "charcoal" grades of tin plate are preferable to less thickly coated grades owing to the reduced likelihood of rusting at breaks and pores and because a better finish is more easily obtained and adhesion improved. Tin plate must be coated with copper before nickel plating, but a chromium coating can be applied directly without nickel or copper undercoatings, although it is more difficult to obtain a good finish.

Copies of the publication treating this subject may be obtained from the council, 149 Broadway, New York.



Slab Turning

To shorten time required to make a complete right angle turn, new method described here was developed. Completely automatic in operation, it easily accommodates a wide range of slab sizes without adjustment

■ RECENTLY a new type of slab turner has been developed which is relatively inexpensive, efficient and simple in operation. It may be installed in new or existing lines without radical changes in existing equipment or rolling methods.

To provide for cross rolling in a blooming mill or the spreading stand in a strip mill, the turning device is usually positioned between the mills. Length of time required to complete the turning operation is an important element in determining production of a mill. The new type slab turner operates rapidly, is fully automatic, and so compact that little space is required for its installation. Thus engaging members may be positioned as close to the delivery side of the mill as the length of slab permits, for as soon as the trailing end leaves the mill the slab turner may engage the leading edge and cause the slab to turn.

Fig. 1 illustrates a slab approaching the device. A shoe, just ahead of the leading edge and positioned between table rollers, is depressed by the slab as it passes over the shoe. This causes the turner to operate and engage the slab.

Fig. 2 shows a slab engaged by the restraining members after they have been actuated by depressing the shoe seen in Fig. 1. The rollers on the table which move the slab during the turning operation have a series of raised spots upon them to aid in moving the slab. These may be applied by welding hard surfacing metal to the rollers.

Fig. 3 reveals the slab partially turned by the device which will retain engagement of the slab until it has been completely turned.

The slab turner itself consists of fluid operated pistons positioned one above and one below the table in such a manner as to operate between table rollers. The slab when it passes over the shoe actuates a trip mechanism which includes a valve admitting fluid under pressure to the cylinders. This forces the top piston down and the lower piston up and so engages the slab on top and bottom sides.

This prevents forward movement of the slab in its original direction. However, table rollers are still in motion so they cause the slab to rotate about the center line of the pistons which act as the pivot point.

The slab engaging piston ends are machined to make point contact with the slab. Also the piston end may include an anti-friction bearing to permit the slab to turn easily.

To reduce the turning friction induced by the slab sliding over the

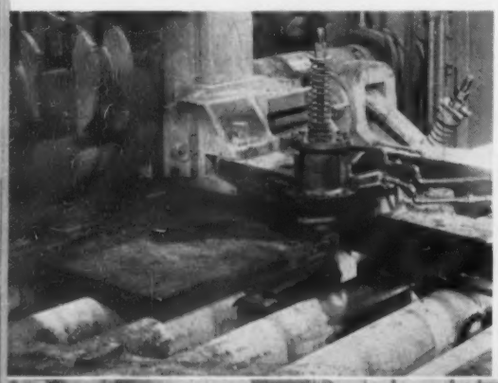


Fig. 1 (Left)—Here the slab is approaching the turner. Fig. 2. (Below at left)—Now slab has tripped shoe which has actuated pistons clamping the slab which now pivots about the device as shown in Fig. 3, below at right. Photos courtesy United Engineering & Foundry Co., Pittsburgh

mill table rollers during the turning operation, the piston positioned beneath the mill table is of larger diameter than the opposing piston mounted above the table. The result is that when the slab is engaged by the piston ends the piston below the table exerts sufficient pressure to overcome the opposing pressure from the upper piston and so lifts the slab above the table at the pivot point.

This then eliminates almost all of the sliding friction since the only part of the slab in contact with roller table is the marginal edge farthest from the pivot point. This provides sufficient torque to rotate the slab easily and quickly.

Disengagement of the restraining pistons is effected by the slab edge which presses against a trigger mechanism positioned on the side guide in such a manner that it is actuated as soon as the slab has been turned through a complete right angle.

A trigger mechanism actuates a pressure relief valve which permits the cylinders to open their non-engaging position by action of springs. Thus, from the instant the main valve is opened to actuate the slab engaging pistons until the slab is turned into its new position, the device operates automatically.

This method is applicable to slabs of various thicknesses and widths and so operates equally well regardless of slab sizes. The unit is mounted on one side guard which is adjustable for maximum and minimum widths of slab. This system was developed at Otis Steel Co., Cleveland, where the device has proved satisfactory in actual mill use. J. F. Spellacy and T. L. Burrell, the inventors, have been granted patents. United Engineering & Foundry Co., Pittsburgh, is the only licensee.

Employing Photoelectric Device to Control Open-Hearth Temperature

■ AN ELECTRIC eye, utilizing a microscopically thin film of rare metal as a "retina," now is being used to improve steel quality by keeping the temperature of 150-ton open-hearth melts more uniform. Not only is the device proving effective in controlling temperature, but it is extending useful life of refractory brick in furnace roofs by as much as 50 per cent. Dr. John Johnson, director of research, United States Steel Corp., reveals this interesting information in reviewing 1938 steel research accomplishments of his Kearny, N. J., laboratory.

Control of open-hearth temperature grew out of the corporation's research to take the guesswork out of steelmaking, according to Dr. Johnston, who declares that much of the effort in the past ten years "has been directed toward improvement of temperature control in many places in the long sequence of steps required in production of finished steel of uniform quality.

"The open-hearth process is perhaps the most important of all steps from the standpoint of temperature. If the steel produced is not uniform in quality as determined by the exacting customer requirements of today, there is nothing that can be done afterward to correct the situation."

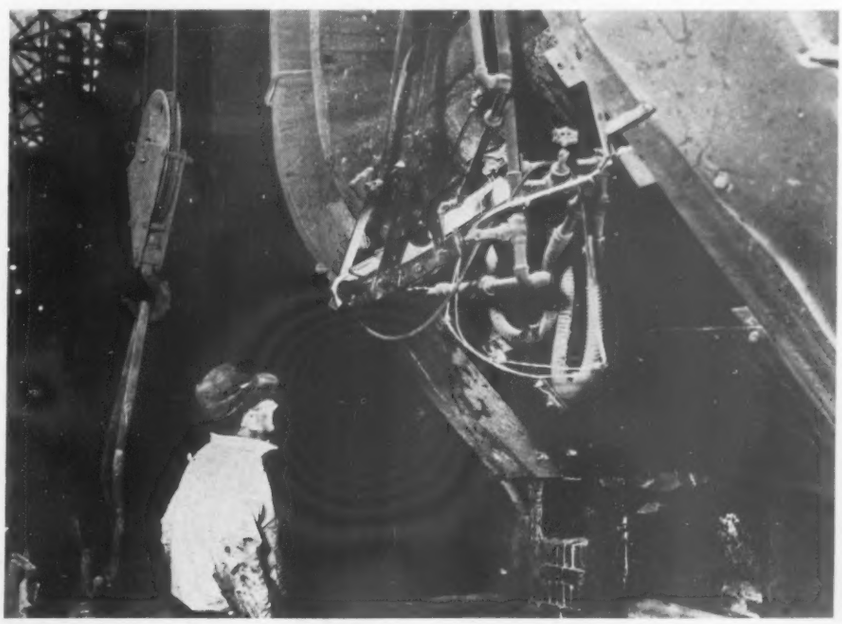
As shown in the accompanying illustration, the photoelectric control unit responsible for this improved quality of steel is installed in the walls of the furnace at such an angle that only light from the roof interior is reflected into it. When the inside temperature gets too high and increases the brightness of the roof too much, part of the fuel supply is turned off automatically.

"Temperature control has contributed greatly to the quality of steel," Dr. Johnston explains, "and although monetary benefits cannot be measured precisely, we are convinced that it has helped to minimize defects in other processes after the steel leaves the furnace. The experienced eye of the open-hearth operator was sufficient to control steelmaking in by-gone days, but today such things as controlled grain size and fine requirements in tensile strength make the difference so slight that the fallible human eye is not quite good enough."

In addition to improved quality of steel, the electric eye control is credited with other benefits, longer life for the refractory brick lining being outstanding among these. In the past, it was necessary to shut down an open hearth for repairs after some 300 heats. Today, it is stated, the same furnace may make as many as 450 or 500 heats, as a result of temperature control.

Automatic temperature control also results in a higher average temperature while the furnace is in operation and thus shortens the time required to produce a melt. The saving in time is measured only in minutes, it is pointed out, but in the steel industry this means thousands of dollars over a year.

An important phase of the work in temperature control has been adoption of a standard system of instrument calibration. Some instruments are sent to the Kearny laboratory, others are calibrated in the mills through standard methods which have been established. Thus the corporation is assured product uniformity.



Exterior mechanism of an electric eye temperature control device installed in the wall of an open-hearth furnace in the Gary, Ind., works of Carnegie-Illinois Steel Corp. The photoelectric unit operates from light reflected by the roof interior and automatically reduces furnace fuel supply when the temperature gets too high

Saves

Pulverizing equipment is welded to lower weight, reduce cost and to make joints dust-tight. Former production difficulties have been simplified

By H. C. ULBRICH
Superintendent,
Raymond Pulverizer Div.
Combustion Engineering Co.
Chicago

■ ALTHOUGH some coal pulverizing units made by Raymond Pulverizer division, Combustion Engrg. Co., Chicago, are standard, the larger portion of pulverizers and associated equipment is of special design.

Construction involves castings or welded steel plates, on coal pulverizing units, with forgings and mild carbon steel plates or sheets on ductwork. Castings and forgings are being replaced by welded steel in this plant.

Some parts such as the pulverized coal classifier, Fig. 8, are intricate and almost impossible to cast or rivet. Legs of classifier have partitions and involved conical-shaped subdivisions. This unit separates pulverized coal into coarse and fine and returns oversize material to be repulverized.

Large stocks of low-carbon mild steel are carried from 14-gage sheets to 2-inch plates. A 200-ton forming press shapes curved surfaces and rolls rings from up to 3 x 3 x ⅜-inch angles and from flat bar stock up to 1 x 3 inch. Considerable quantities of alloy and stainless steel are used on special work.

Welding is used to reduce costs, to make joints and seams dust-tight, and to simplify fabrication. Manufacturing costs have been reduced from 30 to 60 per cent by welding in contrast to riveting or casting and machining. Where a single unit ordinarily cast is to be constructed, we have found that the welding cost is approximately equal to the pattern cost alone. Also, it requires about the same time to fabricate the welded unit as to make the pattern. In addition, welded pulverizing chambers eliminate approximately 75 per cent of the machining cost and one-half the weight of cast units.

Several of the illustrations indicate work which not only would be difficult to fabricate by riveting but in addition would not be as dust tight nor leave a smooth inside surface for the unobstructed handling of material by air as is obtained in welded construction. A smooth surface and dust-tight joints are necessary for unobstructed flow of pulverized material. None of the items operate under sufficient pressure to necessitate stress relieving welds.

Plant is equipped so 20 welders can work at the same time. Two multiple operator, constant potential, motor generator units are used, each capable of supplying welding current for four operators. All other units are single-operator type.

Parts with straight edges are sheared. Odd-shaped material up to ⅜-inch stock is cut on rotary shears; heavier plates up to 10 inches in thickness are flame cut on pantagraph or hand-operated torches. Sheet metal templates are made for parts to be duplicated or likely to be required for repairs or replacement. Fiber board stock is used on special and temporary templates which are not likely to be duplicated.

Although most of the welding is by electric arc, acetylene welding is used to join angle or bar flanges and

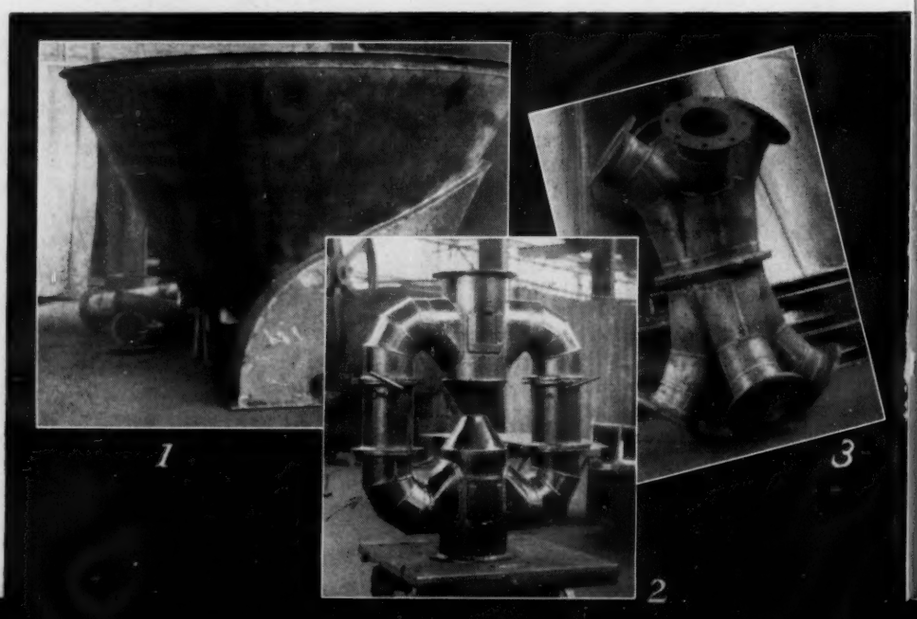


Fig. 1—Welding easily permits adding complicated outlets to collectors. Fig. 2—These two duct outlets have smooth interiors and are light in weight when welded. Fig. 3—Two 4-way distributors. Inside division edges are built up with hard-surfacing metal

50 Per Cent

Fig. 7—Fabricating large rectangular duct to be used between grinding mill and cyclone collector

rings, and to some extent for building up, repairing castings and applying hard-facing metal.

Comparatively small quantities make special welding jigs and fixtures unnecessary. Welders work from centerlines on surface plates, bracing, tacking and tying the parts together with light angles; tack-welding holds work in position until joints are completed, as may be seen in Fig. 9. This top section of the grinding chamber of a cage mill for pulverizing fertilizer at the Southwest Sewage Treatment works, Sanitary District of Chicago, is built up of ¾-inch mild steel plates with 1½-inch plate flanges for bolting sections.

On multiple-operator units usually at least one man is tack welding and fitting while others are completing the joints. Most welds made in stock up to ⅜-inch plates are butt joints welded from the outside thus leaving no bead or seam on the inside to resist the passage of air or the pulverized material. Ducts or light-gage stock are not easily made and kept dust tight when riveted. No gas welding is used on sheet metal or plate work.

Heavier material is generally welded from both sides, after the edges are beveled to form a V-groove. Little of the duct work and accessories are heavier than ⅜-inch plate, however. In making corner welds, side and top plates are butted together at the corners leaving a quarter-round V-opening for depositing the metal, thus permitting practically all of the weld to be made from outside. A light, smooth deposit is placed inside to close any crevices.

All-purpose shielded rod is stored in convenient locations. Fig. 9 indicates one type of rod storage built in under one of the single operator, motor generator sets. Size of welding rod to be used on all work is specified by the foreman.

Plant is laid out for material to move from stock through cutting and forming operations to the welding floor. Work and material is handled by six traveling cranes of from 2 to 20-tons capacity and approximately 30 jib cranes with hand or electric hoists. Thus each welder is supplied with hoists for lifting, turning and holding heavy work during welding operations.

Ducts and cyclone dust collectors make up the largest portion of the work. Ducts, however, vary widely in size and shape. One of the largest is the rectangular duct, Fig. 7, of 24 x 48-inch cross section welded from 3/16-inch plate. This duct is used between the cage mill, Fig. 9, and the cyclone, also of 3/16-inch plate. Rectangular flanges are made from angles or flat stock bent at right angles and welded together and to the duct.

Another duct connection of unusual size and shape is shown in Fig. 4. This duct is 2 x 10 feet at the large opening and 8 feet high. The 10 gage, mild steel, sheet stock is welded at the corners without angle-iron reinforcing.

A common type of duct work is square-to-round transitions. These are necessary in a wide variety of dimensions and thickness of stock. Duct sections are formed on the press brake in two parts. In most cases the angles for flanges are punched and matched before welding, when they are more easily handled. Flanges too small in diameter to roll on the angle roll are built up from circular steel plates and bar stock rolled to a ring for the flange and jointed by gas welding.

Cones for cyclone collectors vary from 2 to 16 feet in diameter, from 14-gage to ⅜-inch thick stock. Welding permits easy attachment of irregular shaped outlets as shown in

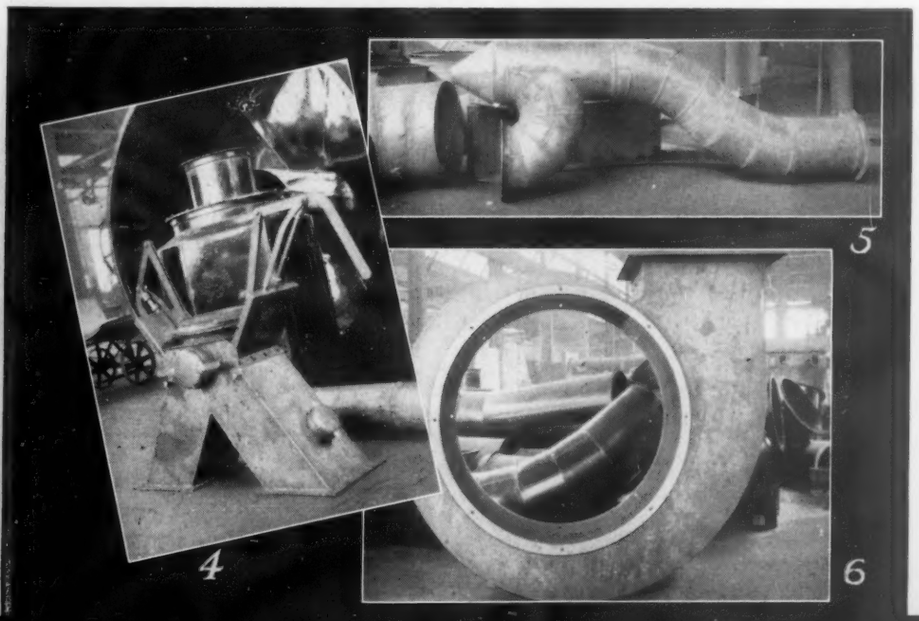


Fig. 4—Special welded 2-way valves for distributing material to either of two stations. Fig. 5—This complicated duct was made easily by welding. Fig. 6—A fan housing of irregular shape was welded at low cost

Fig. 8—Multiple operator, constant potential welding machine here is building a complicated coal pulverizer classifier. Photo courtesy General Electric Co., Schenectady, N. Y.

Fig. 1. Side plates of cones are formed progressively on the press brake.

Vent pipes, Fig. 2, and vent pipe outlets, Fig. 3, (two outlets here are set on top of each other) indicate how elbows and irregular curves and bends are built up.

Fig. 4 illustrates a type of two-way valve used to distribute pulverized material into either of two different stations. Another type of distributer, Fig. 3, for four stations, but without valve is made of ¼-inch plate. It would be practically impossible to rivet or cast this.

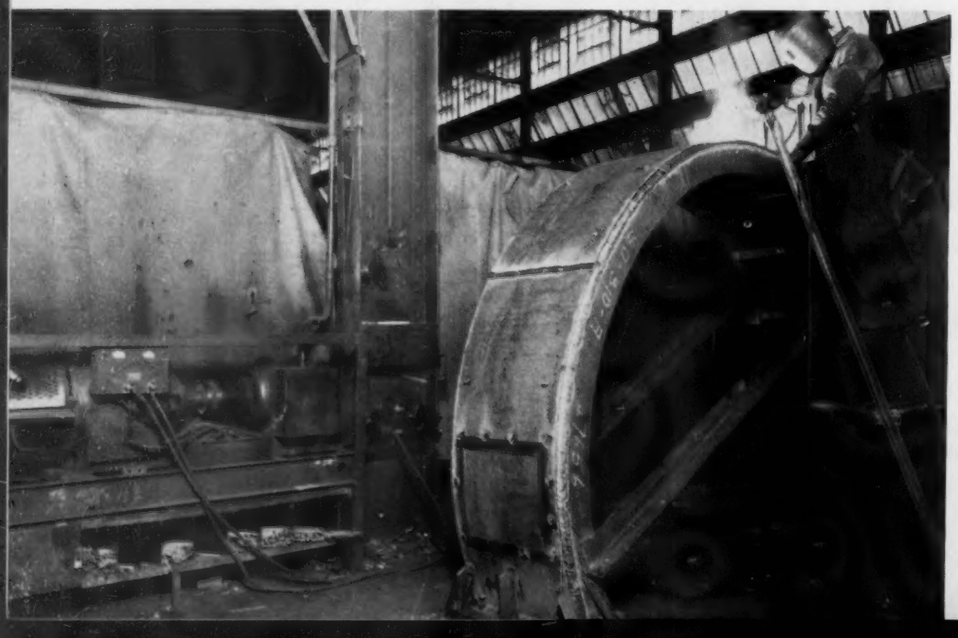
Inside dividing edges on the distributors, Fig. 4, which are subjected to severe wear and could not easily be replaced, are protected by hard-surfacing metal. Most surfaces subjected to excessive wear are protected by replaceable plates, usually of mild steel, although special wear-resisting alloys applied by welding are provided in some cases.

Grinding chambers for standard sizes of pulverizing units are cast iron. Special sizes are usually welded. Fan housings of ¾-inch plates are more easily made by welding than if cast.

Some other types of fan housings are built up solid. The reinforcement for bolting on the cover plate consists of bar stock rolled into a ring and welded on. Fabrication cost of this housing is about equal to the cost of the pattern for a casting, if there is to be no duplication. Also, there is a saving in weight and machining expense.

A number of pulverizing units have been constructed entirely of welded steel plates. The bottom half or base, obviously is much more complicated than the cover or top section construction and frequently these units are of special size or design and probably never duplicated.

Fig. 9—Welding top section of grinding chambers on cage mills for sewage treatment works. Power supplied by a single-operator set. Photo courtesy General Electric Co., Schenectady, N. Y.



It is in such cases that welding makes the largest savings.

These units are constructed in about the time required to make a pattern and at about the same cost. Usually the cast unit is about twice as heavy and involves approximately three times the machining cost.

Now practically all ring flanges, except some in standard dimensions where patterns or forging dies are available, are built up by welding. Where stock up to 3 x 3 x ⅜-inch angles are sufficient, these are rolled and welded in. If heavier stock is required, the metal is cut, formed and welded together.

Flange nuts, formerly forgings, are torch cut from plate, threaded and machined. Machining cost is practically the same in both cases. However, a flange can be made quickly from plate and without die expense or waiting on the outside forge shop.

We are continually increasing the amount of fabrication by welding wherever it shows a saving. As the majority of the work is special and a smooth interior surface is desirable it is not likely that we will return to riveting. Saving in weight, convenience and cost reductions preclude this possibility.

♦

Research Aims to Stop Boiler Steel Cracking

■ Research recently conducted by the bureau of mines, Washington, was directed toward discovery of a means of preventing intercrystalline cracking of boiler steel.

This cracking is caused by boiler water eating into grain boundaries to form cracks so narrow that they frequently go all the way through before they are visible. Unconcentrated water does not cause cracking. Concentrated water will cause cracking only when it contains a peculiar balance of corrosive and protective properties, to give a protective film over grain faces of the metal but with grain boundaries exposed. High stresses must be present in the metal if cracking is to proceed.

Certain organic chemicals have been found especially useful in the prevention of intercrystalline cracking. Some of these have been in use many years in boiler compounds without their particular action being known. A testing unit has been developed for measuring the intercrystalline attack. It may be attached directly to boiler or may be used in the laboratory. It will crack and break a steel specimen if water is dangerous.

Production Specials

Output is diversified by adding items which utilize present shop equipment and skill of workers. Supplying different markets levels off seasonal peaks formerly felt

By E. D. KASER
President & Gen. Mgr.
Durabilt Steel Locker Co.
Aurora, Ill.

■ PLANTS equipped for sheet metal working on products built largely on order, such as lockers and cabinets in our case, must keep on the lookout for additional or fill-in items which utilize similar equipment and experience. Frequently, demand for these extra items can be built up until they become a good profitable division of the business.

Demand for our main product, steel lockers, is more or less seasonal and irregular with a tendency toward quantity orders. Also the demand is closely related to the construction of schools, clubs and the activity of business offices and industrial plants.

To fill in periods of low locker production the following lines have been developed: Storage and wardrobe cabinets similar to lockers; all-steel and steel-reinforced table-tennis tables; and cold storage Lockerators, Fig. 5, all of which are distributed through our sales organization. Other miscellaneous work on contract includes metal display frames for advertising signs, safes and stands for coin-operated vending machines, miscellaneous stampings, heating boiler jackets, stoker covers and similar sheet metal work.

Most of these items are made in fair quantities and all are constructed of sheet metal reinforced by light structural or formed shapes and built up by cutting, punching, forming, bending, riveting and welding. Some items are so similar as to require only a few individual dies. A variety of dimensions and gages of sheet stock are kept on hand for regular production so any moderate requirement can be met without putting in a special order for material. Bulk of the work is in 16, 20 and 24-gage sheet steel. Special products use from 11 to 28-gage. Practically all sheets are hot rolled annealed stock although some are special enameling stock. For the table-tennis table top, stretcher leveled steel is used.

Development and construction of two lines brought out during the depression, table-tennis tables, Fig. 1, and metal Lockerators, Fig. 5, for neighborhood cold storage plants, indicate the problems incidental to the production and promotion of additional lines. In many ways production is the easiest and simplest part of the development work.

It may be necessary to foster the demand for an item, as was the case with the table-tennis table. In other instances, a trend or demand must be recognized early and equipment be supplied to fill it, as was the case with the cold storage Lockerator. Contract work of course requires keeping in close touch with concerns requiring production work which the plant can supply, and maintaining mutually satisfactory business relations in quality, price and delivery.

The table-tennis table is the largest and heaviest unit manufactured,

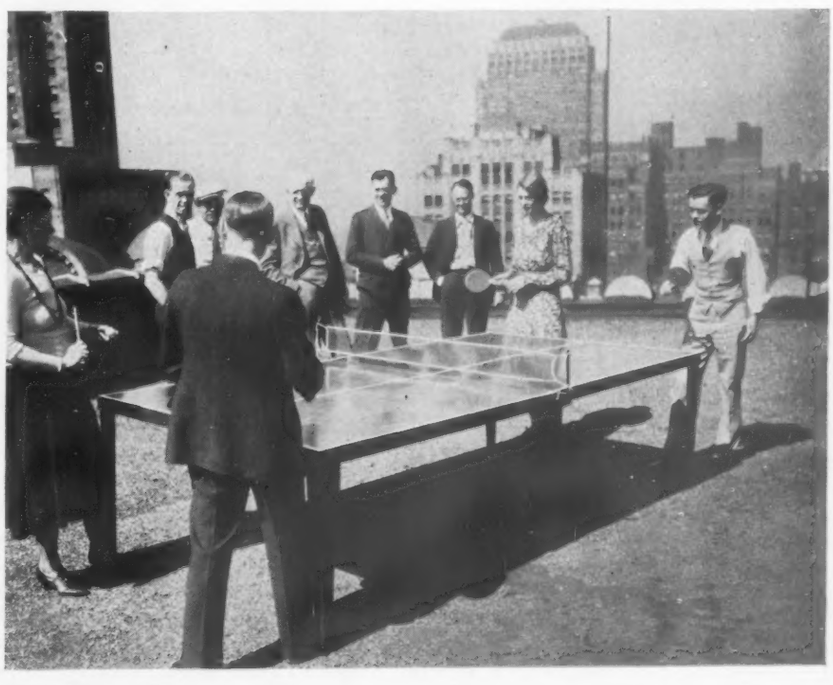


Fig. 1—Folding all-metal table used for noontime recreation on roof of office building

but the methods and equipment for construction are similar to other regular work. Demand for this product arose during the depression due to increased interest in recreational activities.

Design and method of reinforcing our first tables made them too heavy and for all practical purposes a stationary unit. This about excluded them from the home market and limited them to recreational center demand as the standard playing court is 5 by 9 feet and 30 inches high.

Table Redesigned

Thus it became necessary to design a lighter table that could be folded when not in use, yet be rigid under all conditions of play. Top must be perfectly level, withstand impingement of the ball and have a surface into which the ball will "bite" instead of sliding. Obtaining the proper finish for the top was the most difficult problem, incidentally.

Location of net at center permitted folding the table without affecting the playing court. Lighter top and frame with legs which could be folded under were indicated.

After considerable experimentation, production has been standardized on three types of tables. Two types are built with plywood tops, steel reinforced, and one type is of all-steel construction for either indoor or outdoor use. All three have six diagonally folding steel legs which are set back from ends so as not to interfere with foot room.

Design and construction of the leg is the only entirely new and patentable feature. Triangular cross section shown in Fig. 2 combines strength with rigidity and presents a flat side for diagonal folding. Leg is made of 20-gage sheet steel. The

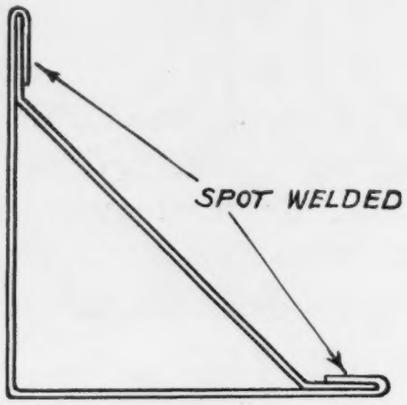


Fig. 2—Cross section of leg for table-tennis table

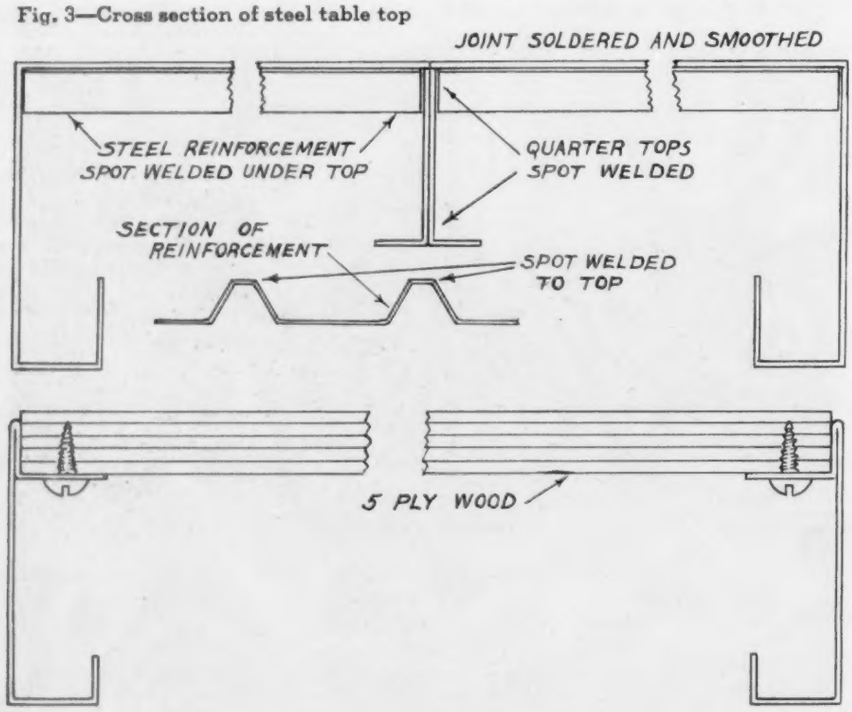
two parts are formed on a press brake, inner channel strip slipped in from the end, fold crimped tight and electrically spot welded.

Top for all-metal table consists of two halves which are made of two symmetrical parts formed from 18-gage, cold rolled, stretcher leveled steel. Strength and stiffness are provided, Fig. 3, by three right-angle breaks along edges. A special corrugated steel reinforcement, shown in Fig. 3, is spot welded to under surface of each quarter. Two quarters are welded together and open surface joints soldered tight and smooth.

Steel frame for plywood table is made by a series of right breaks to form a horizontal ledge, Fig. 4, to which the plywood is fastened with screws. This J-shaped frame protects the plywood edges and provides all the strength and rigidity required.

Legs and frame on both tables are colored, wrinkle finish, baked enamel. Both metal and plywood tops have better playing surfaces with a thin finishing coat. Protection against moisture and perspiration is necessary. Plywood is finished in a dark green or claret alcohol-resisting lacquer of high protective quality but as thin a coat as possible. Steel tops require fine inert material in the baked enamel coating to provide the necessary "bite" for the ball.

Fig. 3—Cross section of steel table top


JOINT SOLDERED AND SMOOTHED
STEEL REINFORCEMENT SPOT WELDED UNDER TOP
QUARTER TOPS SPOT WELDED
SECTION OF REINFORCEMENT
SPOT WELDED TO TOP
5 PLY WOOD

Storage for Frozen Food

Development of the cold-storage Lockerator grew from demand for owner storage of frozen meats, fruits and vegetables in rural communities and small towns. Formerly fresh meats were available to farmers only during cold winter months. In the South, meats usually had to be curved or consumed immediately.

With the development of the sharp freezing process, fresh meats, fruits and vegetables may be kept indefinitely for year around consumption. After butchering, meat is chilled, cut and wrapped in usable portions, as specified by the customer.

These packages are then frozen in a sharp freeze room at 10 to 12 degrees below zero Fahr. After this, packages are placed in the individual locked cabinets or Lockerators to which the customer alone has access. Here a temperature of 10 degrees above zero Fahr. is maintained.

Fresh fruits and vegetables are packed in a similar manner.

Lockerators are a modification of our line of multiple tier steel lockers, with provision for ample ventilation and so sides, top, bottom and end can be removed for cleaning.

Individual Lockerators are usually built 30 inches deep from front to back, 18 or 20 inches wide and 16, 17 or 18½ inches high. Lockerators are tiered five high and each holds about 300 pounds of heat. Each is provided with a special springbolt lock with unlimited key changes, keys to be retained by the customer.

A sliding drawer in bottom tier promotes easy access to the contents and commands a higher rental. Many installations have

Fig. 4—Cross section of wood top showing formed steel shelf

Fig. 5—Lockerators for individual cold storage of meats, fruits and vegetables using doors for upper compartments and drawers at bottom

drawers in the two lower tiers. Drawers have stops and are set on four 1-inch rollers mounted in heavy formed 1¾ x 1½-inch channels.

Door frames are constructed by riveting 1 x 1 x ⅛-inch steel angle uprights to 1½ x ¾-inch channel cross members formed from 14-gage steel. Door front is 16-gage special enameling steel, flanged on three edges with a deep vertical emboss near the fourth edge to add strength. A heavy steel pan-shaped reinforcement is spot welded to the inside of the door near the outer edge for additional rigidity.

Chief difference in construction between Lockerators and usual storage cabinets is in provisions for cooling, ventilating and cleaning. Eighteen louvres, 4½ inches wide with ⅜-inch openings, are made in the doors and fronts of the drawers. Approximately one-third area of sides, end and bottom is punched with ½-inch round holes on 1-inch centers.

Sides, bottom and back of each Lockerator is removed for cleaning by loosening four bolts and nuts, accessible only from the interior. Some units are built with nonremovable interiors, however. Removable, heavily hot-tinned, woven wire grills are used sometimes. The same ventilated door is used with these.

To withstand the low temperature of 10 degrees without flaking, it was necessary to develop a modified, high temperature, synthetic, baking enamel similar to that used on refrigerators. Several color combinations are available. Cadmium plated screws, bolts and nuts are used.

By developing additional products which utilize the present skill and experience of the workers and the same production equipment it is possible to introduce these special items in the production line with a minimum of inconvenience, expense, interruption to regular work and tooling. Thus maximum benefits from the added lines may be obtained.

Lightweight Alloy Has Desirable Properties

■ A nonferrous silvery alloy, said to be two-thirds lighter than steel and unusually resistant to corrosion, has been developed by Colonial Alloys Co., Philadelphia. Known as Colalloy, this metal is produced in a wide variety of forms, shapes, gages and sizes.

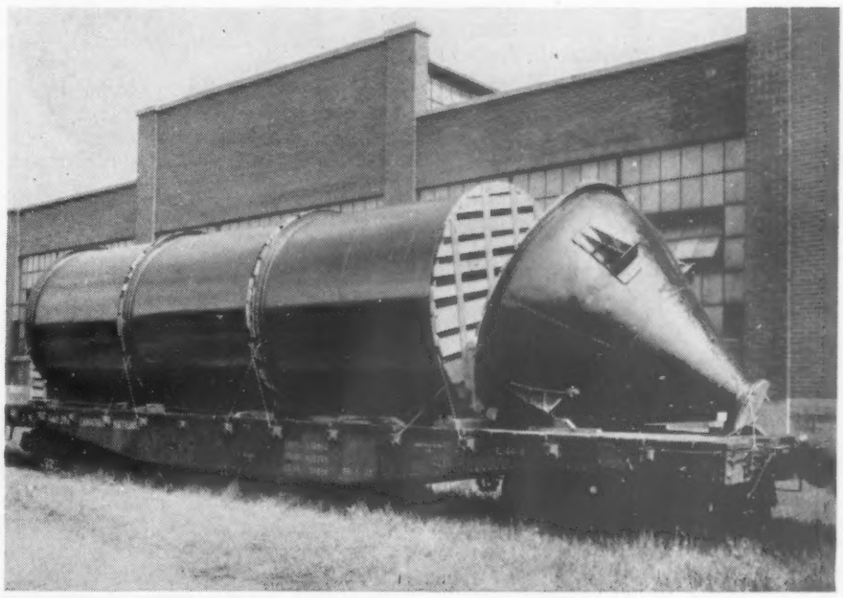
It is suitable for use in the manufacture of pans, trays, trucks, containers and similar items, where light weight, strength, corrosion resistance, nontoxicity, electrical and thermal conductivity and nonspark qualities are required. Salts of this metal are colorless, odorless, nontoxic, tasteless and noncontaminating to foods. It has a wide range of hardness, tensile strength, and workability, and lends itself to common fabrication practices. In natural appearance Colalloy is silvery, but it is available also in satin and other surface effects.

Graphite in Castor Oil Used as Meter Lubricant

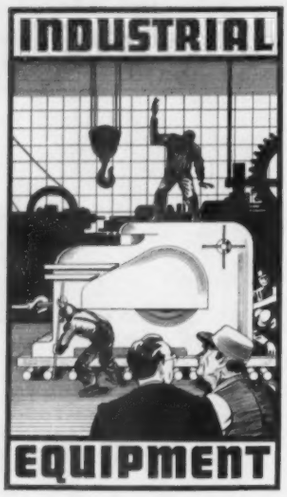
■ A new method of lubricating the moving parts of such delicately adjusted mechanisms as are found in orifice type flow-meters is suggested in the use of a colloidal dispersion of graphite in pure castor oil.

This lubricant was developed by Acheson Colloids Corp., Port Huron, Mich., as a result of tests to find a lubricant for divisional shafts and bearings of a meter handling gas containing hydrogen sulphide, under pressures up to 50 pounds per square inch. Any gas leakage or gumming of lubricant would result in meter failure. It was found that colloidal graphite is castor oil provided a sealing action without mechanical pressure means and without increasing carrier viscosity. Castor oil dispersion of graphite, it is said, may be dispersed also in light greases or blended with low freezing point fluids to meet either high or low temperature lubrication requirements.

Line Paper Mill Tanks with Rubber



■ **Above is one of three retention tanks recently installed in the chlorinating section at the plant of Abitibi Power & Paper Co., Smooth Rock Falls, Ont. Built of ¼-inch mild steel in four sections, tanks each have an overall height of 38 feet 4 inches and an inside diameter of 9 feet. They were lined with ⅜-inch hard rubber of B. F. Goodrich Co. of Canada, Kitchener, Ont. Lining was cured at 30 pounds internal steam pressure**



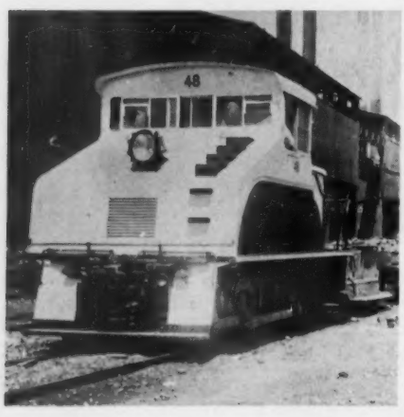
Direct-Drive Diesel Locomotive Introduced

■ Plymouth Locomotive Works, division of Fate-Root-Heath Co., Plymouth, O., has brought out a heavy duty, direct-drive diesel switching locomotive, called the Flexomotive, said to be the first of this type available in sizes from 45 to 70 tons in weight.

Locomotive is massively and ruggedly built and yet is effectively streamlined. In its drive a broad adaptation of the planetary transmission with two units provides four speeds forward and reverse. Planetary units consist of two large drums containing epicyclic gears, control of the output from these members being secured through an outside and inside clamping brake in each unit. After 7000 hours on test these brakes showed negligible wear. Control of brakes is through air cylinders operated by remote control electropneumatic valves.

Operator's position is at right side of cab, and visibility is clear at all angles. Control assembly may be operated with one hand, and speed changes take place without losing momentum of train.

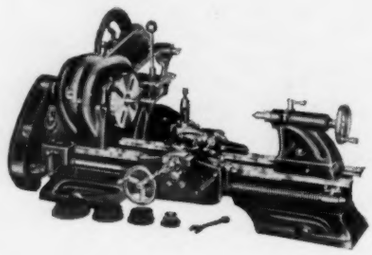
The 45-ton model is equipped with a heavy duty diesel engine, Model EN, manufactured by Cooper Bessemer Corp., Mt. Vernon, O. It has 8 x 10½-inch cylinders and develops 340 horsepower at 850 revolutions per minute, at which speed it is normally governed for this service. Low first cost and low operating expense are said to be inherent in the design of this locomotive. Average maintenance cost has been set at about 20 cents per hour, including all items.



Backgeared Lathe Has Horizontal Countershaft

■ Atlas Press Co., Kalamazoo, Mich., has added to its line the F-series backgeared screw-cutting lathes, equipped with power cross feed, improved carriage, horizontal bench-type countershaft, headstock safety guard and other refinements.

Standard equipment also includes automatic, reversible longitudinal feeds; graduated compound rest; tool post, ring and rocker; complete set of change gears to cut 4 to 96 threads per inch; threading chart and dial; countershaft with motor mounting bracket; complete V-belt drive; 10-ampere switch and switch cord; 6-inch face plate two 60-degree centers reducing sleeve for headstock center; combination tool post and compound wrench; and instruction book.

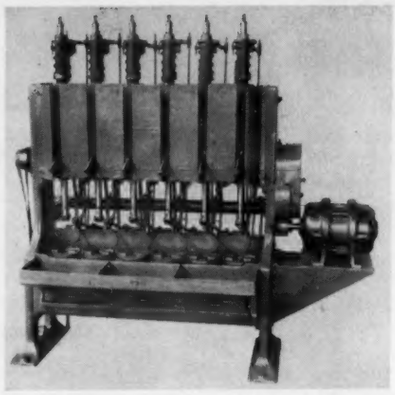


The No. H36 lathe, illustrated, has a 10-inch swing, 36-inch bed and an 18-inch capacity between centers. It is priced at $104.75 less motor. Other models in the series have 42, 48 and 54-inch beds, and are 24, 30 and 36 inches between centers, respectively.

Tapper Has Automatic Air-Operated Chucks

■ Acme Machinery Co., 4537 St. Clair avenue, Cleveland, has introduced a six-spindle, semiautomatic coupling tapper, which is said to tap at the rate of 1250 ¾-inch couplings per hour.

Scroll air chucks, with which each spindle is provided, are closed and opened automatically with the downward movement of the spindle.



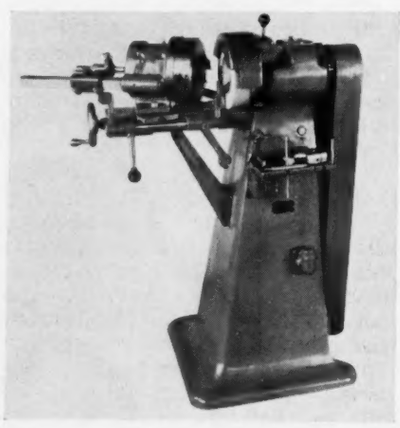
In operation of the tapper, coupling is placed in the chuck and operator trips a small lever at right of the spindle. Spindle then completes its cycle, first valving air to close the chuck, then tapping the coupling, after which air is again valved, opening chuck and allowing spindle to return to its starting position through the power-actuated cams, with coupling on the tap shank.

Spindles are provided with oil check valves, with a small bleeder valve, which makes it possible to cushion the spindle the desired amount on its downward stroke. Machine has a work capacity range of from ⅛-inch to 1¼-inch standard pipe couplings.

Drillpointer Furnished For Wet or Dry Grinding

■ Oliver Instrument Co., Adrian, Mich., has placed on the market its No. 510 drillpointer, a heavier machine than previous models, featuring improvements that widen its usefulness.

On this grinder drill is held in a rotating chuck and each lip is presented to the grinding wheel in rotation. Clearance is provided by an oscillating motion of the grinding wheel, controlled by a cam. Drill-holding chuck is on a swivel base which permits grinding point angles from 82 degrees to 160 degrees in-



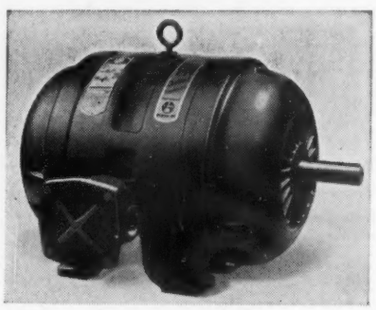
cluded angle. A variable cam gives four different clearance angles to the cutting edge.

All shafts except the chuck and quill are equipped with antifriction bearings, and the wheel spindle has Timken roller bearings. Chuck drive is controlled through a positive clutch.

This machine grinds all drills from ¼-inch to 3 inches in diameter and is equipped for drills having 2, 3 or 4 flutes. It is made in two styles, for wet or dry grinding.

Explosionproof Motors Are Fully Protected

■ Fairbanks, Morse & Co., 600 South Michigan avenue, Chicago, have introduced a line of explosionproof ball bearing motors, approved by Underwriters' Laboratories for Class I Group D hazardous locations such as are found in plants producing or



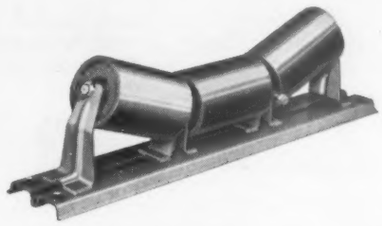
employing gasoline, acetone, alcohol, volatile oils or combustible gases.

These motors can be applied to pumps, blowers, production machines, etc., as readily as any standard motor. Double-end ventilation provides positive cooling from both ends of the motor and eliminates "hot spots," thus adding to the life of motor windings. Removal of protective covers or other parts is unnecessary when replacing lubricant.

Belt Conveyor Idler Runs on Ball Bearings

■ Link-Belt Co., 307 North Michigan avenue, Chicago, has developed a low-priced, troughed, antifriction idler for belt conveyors handling materials of medium weight, consisting of fines and small lumps.

This idler, designated as type 90, is intended for conveyors 14 to 24 inches wide. Rolls are smooth finished 4-inch steel tubing with formed heads pressed into and welded to each end. They are mounted close together in reinforced steel brackets welded to a steel mine-tie bas, ends of which have slotted holes, permitting convenient adjustment on supporting framework. Space between rolls is small, and creasing of belt is avoided. Return roll idler, type 91, is supported by reinforced steel



hangers having slotted openings which serve as seats and anchors for holding necked roll shaft in place.

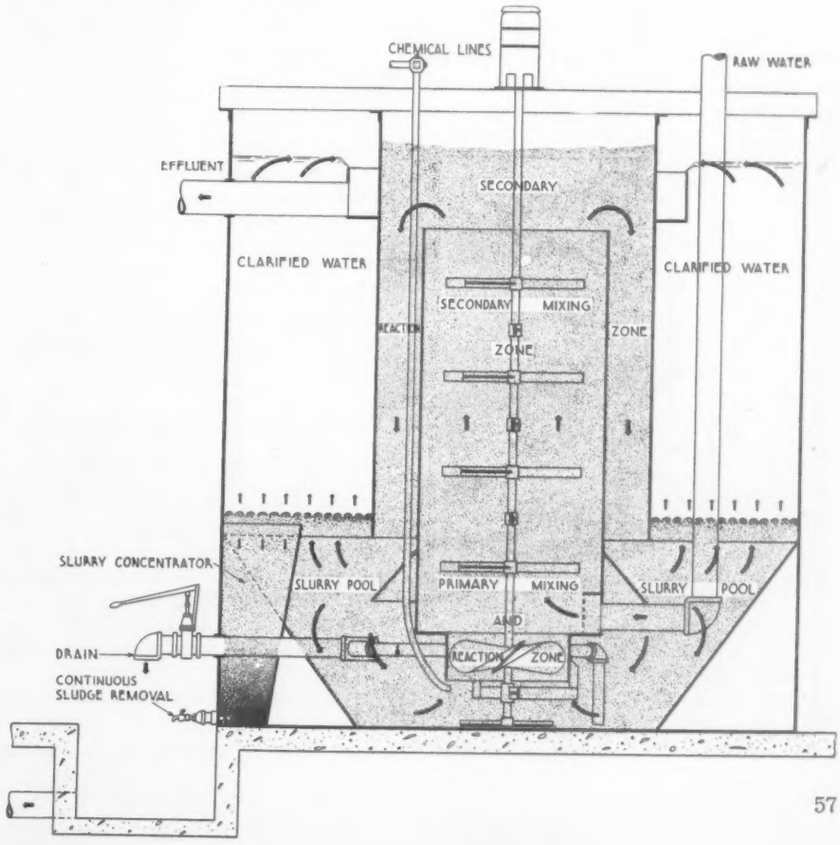
Water Softener Employs Revised Treating Method

■ International Filter Co., 59 East Van Buren street, Chicago, has developed a new type of water softener, known as the Accelator, available in a large range of capacities to meet all requirements.

Unlike conventional lime or lime-soda processes, this softener does not employ sedimentation. Water is actually squeezed from the top of a recirculated pool of slurry. In this process means are provided to accelerate the chemical and physical reactions involved. Because of this, space requirements are reduced.

This softener is not merely a departure in design. Its underlying principle is an entirely new treating method. Treating chemicals are applied to the water in a new way, and reactions occur under new conditions.

Diagram showing arrangement of an Accelator water softener for smaller capacities. This setup is said to require less space than the conventional equipment



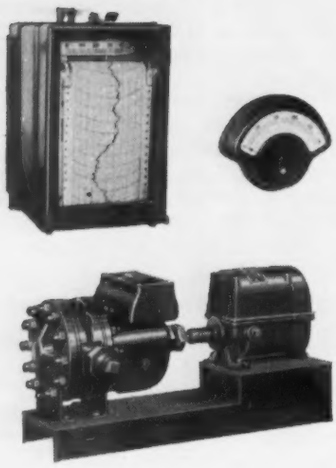
System Measures Fuel Oil Consumed by Furnace

■ S. F. Bowser & Co., Ft. Wayne, Ind., have devised a system that measures amount of fuel oil consumed by a furnace, and also indicates and records the rate at which fuel is being delivered to the furnace.

Standard system consists of a registering meter, directly connected to a tachometer generator and mounted on a substantial base; also a wide vision indicator actuated by the generator. A combination indicator and pen-writing recorder can be furnished.

On being pumped into the registering meter, fuel causes displacement rotor to revolve. Extended end of shaft to which rotor is fixed is directly connected to the tachometer generator, which generates low voltage electrical force that actuates wall indicator dial.

By assuring constant accuracy in measurement and indication, this system permits a close check to be kept on fuel consumption and burner efficiency. Known as the Mir-o-



Meter, system can be installed easily. Meter and generator can be installed wherever desired, and the indicator and indicator - recorder placed at points up to 750 feet from the generator.

Four Tools Are Combined In Versatile Machine

■ Gilman Engineering Works, Janesville, Wis., has devised a four-in-one toolroom machine, comprising a precision lathe, horizontal mill, vertical mill and drill press.

Lathe has a 9-inch swing, is 12 inches between centers and has a 24-inch bed. Tailstock is adjustable to take up wear. A special device permits clamping the compound rest at any position on the lathe bed.

Horizontal mill has a 4 x 18-inch table, with 10-inch travel. A 1-horsepower motor, mounted in the base, drives both this mill and the lathe. Eight speeds range from 80 to 2500 revolutions per minute. Vertical mill quill may be raised or lowered 4 inches. Vertical mill head is turned 90 degrees over an 8½-inch table to form the drill press.

Timken bearings are used throughout this machine. Complete unit weighs approximately 1000 pounds.

Steel Valves Operate at 150 Degrees Below Zero

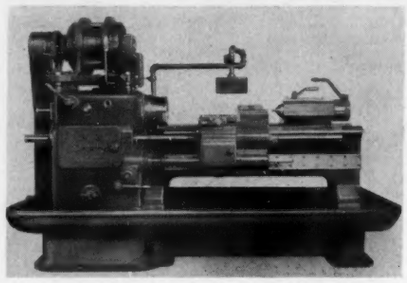
■ Merco-Nordstrom Valve Co., Oakland, Calif., recently furnished a large quantity of valves for an ethyl chloride producing plant where temperatures to —150 degrees Fahr. will be encountered, according to a recent issue of *Nickel Steel Topics*. The valve bodies, weighing up to 500 pounds as cast, contained 0.08 per cent carbon, 0.30 per cent maganese, 0.12 per cent silicon, 4.05 per cent nickel, 0.50 per cent molybdenum and 0.16 per cent vanadium. They easily withstood Charpy impact test of 15 foot pounds at —150 degrees Fahr. and a hydrostatic pressure test of 1000 pounds per square inch.

After normalizing at 1800 to 1850 degrees Fahr., oil quenching from 1550 degrees and drawing at around 1200 degrees, tensile strength was 107,000 pounds per square inch, yield point 88,000 pounds per square inch, with 22.5 per cent elongation in 2 inches and a 61 per cent reduction in area. Actual Charpy impact tests on keyhole notch specimens gave a value of 20 foot pounds.

Lathe Has Simplified Changeover Mechanism

■ Seneca Falls Machine Co., Seneca Falls, N. Y., has announced an automatic cam-operated lathe, known as the Model LR Lo-Swing, embodying a simplified changeover mechanism with which length of carriage stroke may be varied quickly and easily.

This lathe's field includes practically all work within its capacity—5½-inch swing and up to 46 inches between centers. It is entirely mechanical and has no clutches in the feed train. All rotating shafts are



friction bearing equipped, and adequate lubrication is assured. Carriage ways are hardened steel. Lathe can be equipped with either direct V-belt drive to the spindle for high speed, fine finishing cuts, or with a geared drive for slower roughing cuts. It may be equipped also with a third slide as well as additional back squaring attachments, carriages and carriage slides, making possible varied tooling operations.

Maximum efficiency with carbide tools is claimed because of these design features: Good tool support afforded by V-way construction; main carriage support in a direct line with tool pressure; all tools move directly in towards work on a straight line. A feed throwout control permits operator to stop feed with spindle still revolving.

Tests Insulation of Low-Voltage Equipment

■ Ideal Commutator Dresser Co., 5076 Park avenue, Sycamore, Ill., has developed a simple instrument for testing insulation of low-voltage equipment up to 2500 volts. This device will indicate instantly whether or not there is a short circuit, ground or broken wire.

Safety is an important feature of the tester's design. All current carrying parts are fully insulated. Safety features include a three-wire primary cord, spring operated cover over high-potential secondary test points and red indicating lamp.

Recovery In Steel Operations Sharp

Lifting Of Year-End Influences Spurs Specifications

■ STEEL demand and production have snapped back from the depressed levels prevailing over the holidays. This restores operations to about the pre-Christmas rate at 51.5 per cent, with further gains in sight.

Recovery in specifications so far has been principally seasonal, since a major share of the gain is compensation for the curtailment of shipments and the reduction of buyers' inventories at the year-end. With the replenishment of stocks, subsequent changes in steel output will be guided by the trend of consumption.

Producers have fairly large tonnages scheduled for January shipments. Backlogs have been swelled by the recent placing of additional orders for automotive steel, involving bars, tubing and flat-rolled material. Unfilled business in structural shapes and concrete reinforcing bars has been increased markedly by closing on public works projects the past several weeks. Additional steel buying of the latter nature is in prospect, although general contractors' bids are in on the bulk of major construction financed by federal funds.

Steelmakers are eyeing congressional activities, not only with regard to broad policies of that body but also with reference to proposed railroad legislation and armament appropriations. Probable expenditures by the carriers for track material and equipment remain somewhat indefinite, but unless outside financial assistance is forthcoming, steel purchases will be regulated largely by revenue.

Only Few Railroads Active In Rail, Equipment Buying

Recent purchases by the railroads include 30,000 tons of rails by the Northern Pacific and the placing of ten freight locomotives by the Norfolk & Western to its own shops. Canadian National is in the market for 2000 box cars.

Automobile production is steady at a rate about 50 per cent above that a year ago but moderately below the December peak. Output last week was 76,685 units, practically unchanged from the 77,415 units assembled the preceding week. Only slight variations were shown in operations of individual companies.

Pig iron production in December was 47 per cent larger than a year ago but declined 3 per cent from the November total. On a daily basis, last month's output was down 6 per cent from November, first decrease since June. Total output was 2,212,718 tons, against 2,286,661 tons in November and 1,503,474 tons in December, 1937.

Despite the second half recovery, 1938 pig iron production of 18,889,663 tons was 48.6 per cent below the 36,709,139 tons of 1937 and was the smallest yearly figure since 1934. Number of active blast furnaces Dec. 31 was 115, a decrease of six for the month but 22 more than a year ago.

See Marked Recovery In 1939 Tin Plate Output

Tin plate producers, after experiencing in 1938 the sharpest drop in operations in history, are looking forward to recovery in demand and output this quarter. Some improvement occurred last month and heavier buying for manufacture of packers' cans is in view.

Practically all districts contributed to last week's 11.5-point rise in steelmaking which brought the national rate to almost double the 26 per cent average a year ago. Several individual plants boosted schedules higher than any prevailing in 1938. Principal gains were 18 points to 44 per cent at Pittsburgh, 18 points to 50 per cent at Youngstown, 14 points to 64 per cent at Wheeling and 12 points to 91 per cent at Detroit.

Chicago was up 7 points to 53 per cent, eastern Pennsylvania 5 points to 34 per cent, Cincinnati 22 points to 72 per cent, St. Louis 3 points to 45.5 per cent and Cleveland 4 points to 54 per cent. Birmingham at 77 per cent and New England at 70 were unchanged.

Scrap markets generally have a strong tone in the face of quiet demand—a favorable omen. All price composites are unchanged: Scrap at $14.79, iron and steel at $36.36 and finished steel at $56.50. Finished steel prices are firm.

COMPOSITE MARKET AVERAGES

	Jan. 7	Dec. 31	Dec. 24	One Month Ago Dec., 1938	Three Months Ago Oct., 1938	One Year Ago Jan., 1938	Five Years Ago Jan., 1934
Iron and Steel	$36.36	$36.36	$36.37	$36.36	$36.48	$38.95	$31.15
Finished Steel	56.50	56.50	56.50	56.50	57.04	61.70	51.10
Steelworks Scrap..	14.79	14.79	14.83	14.77	14.00	13.85	11.24

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, bars, black pipe, rails, alloy steel, hot strip, and cast iron pipe at representative centers. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished Material

	Jan. 7, 1939	Dec. 1938	Oct. 1938	Jan. 1938
Steel bars, Pittsburgh	2.25c	2.25c	2.25c	2.45c
Steel bars, Chicago	2.25	2.25	2.25	2.50
Steel bars, Philadelphia	2.57	2.57	2.57	2.75
Iron bars, Terre Haute, Ind.	2.15	2.15	2.15	2.35
Shapes, Pittsburgh	2.10	2.10	2.10	2.25
Shapes, Philadelphia	2.215	2.215	2.215	2.465
Shapes, Chicago	2.10	2.10	2.10	2.30
Plates, Pittsburgh	2.10	2.10	2.10	2.25
Plates, Philadelphia	2.15	2.15	2.15	2.445
Plates, Chicago	2.10	2.10	2.10	2.30
Sheets, hot-rolled, Pittsburgh	2.15	2.15	2.10	2.40
Sheets, cold-rolled, Pittsburgh	3.20	3.20	3.15	3.55
Sheets, No. 24, galv., Pittsburgh	3.50	3.50	3.50	3.80
Sheets, hot-rolled, Gary	2.15	2.15	2.10	2.50
Sheets, cold-rolled, Gary	3.20	3.20	3.15	3.25
Sheets, No. 24, galv., Gary	3.50	3.50	3.50	3.90
Bright bess., basic wire, Pitts.	2.60	2.60	2.60	2.90
Tin plate, per base box, Pitts.	$5.00	$5.00	$5.35	$5.35
Wire nails, Pittsburgh	2.45	2.45	2.45	2.75

Semifinished Material

Sheet bars, open-hearth, Youngs.	$34.00	$34.00	$34.00	$37.00
Sheet bars, open-hearth, Pitts.	34.00	34.00	34.00	37.00
Rerolling billets, Pittsburgh	34.00	34.00	34.00	37.00
Wire rods, No. 5 to 5/32-inch, Pitts.	43.00	43.00	43.00	47.00

Pig Iron

	Jan. 7, 1939	Dec. 1938	Oct. 1938	Jan. 1938
Bessemer, del. Pittsburgh	$22.34	$22.34	$22.34	$25.26
Basic, Valley	20.50	20.50	20.50	23.50
Basic, eastern, del. Philadelphia	22.34	22.34	22.34	25.34
No. 2 foundry, Pittsburgh	22.21	22.21	22.21	25.21
No. 2 foundry, Chicago	21.00	21.00	21.00	24.00
Southern No. 2, Birmingham	17.38	17.38	17.38	20.38
Southern No. 2, del. Cincinnati	20.89	20.89	20.89	23.89
No. 2X, del. Phila. (differ. av.)	23.215	23.215	23.215	26.215
Malleable, Valley	21.00	21.00	21.00	24.00
Malleable, Chicago	21.00	21.00	21.00	24.00
Lake Sup., charcoal, del. Chicago	28.34	28.34	28.34	30.24
Gray forge, del. Pittsburgh	21.17	21.17	21.17	24.17
Ferromanganese, del. Pittsburgh	97.77	97.77	97.77	107.49

Scrap

Heavy melting steel, Pittsburgh	$15.50	$15.50	$14.95	$14.05
Heavy melt. steel, No. 2, E. Pa.	13.25	13.20	12.95	13.75
Heavy melting steel, Chicago	13.75	13.85	13.05	13.25
Rails for rolling, Chicago	17.75	17.75	16.25	14.90
Railroad steel specialties, Chicago	16.00	16.05	15.55	15.75

Coke

Connellsville, furnace, ovens	$ 3.75	$3.75	$3.75	$4.25
Connellsville, foundry, ovens	5.00	5.00	5.00	5.25
Chicago, by-product fdry., del.	10.50	10.50	10.50	11.00

STEEL, IRON, RAW MATERIAL, FUEL AND METALS PRICES

Except when otherwise designated, prices are base, f.o.b. cars.

Sheet Steel

Hot Rolled

Pittsburgh	2.15c
Chicago, Gary	2.15c
Cleveland	2.15c
Detroit, del.	2.25c
Buffalo	2.15c
Sparrows Point, Md.	2.15c
New York, del.	2.39c
Philadelphia, del.	2.32c
Granite City, Ill.	2.25c
Middletown, O.	2.15c
Youngstown, O.	2.15c
Birmingham	2.15c
Pacific Coast points	2.65c

Cold Rolled

Pittsburgh	3.20c
Chicago, Gary	3.20c
Buffalo	3.20c
Cleveland	3.20c
Detroit, delivered	3.30c
Philadelphia, del.	3.52c
New York, del.	3.54c
Granite City, Ill.	3.30c
Middletown, O.	3.20c
Youngstown, O.	3.20c
Pacific Coast points	3.80c

Galvanized No. 24

Pittsburgh	3.50c
Chicago, Gary	3.50c
Buffalo	3.50c
Sparrows Point, Md.	3.50c
Philadelphia, del.	3.67c
New York, delivered	3.74c
Birmingham	3.50c
Granite City, Ill.	3.60c
Middletown, O.	3.50c
Youngstown, O.	3.50c
Pacific Coast points	4.00c

Black Plate, No. 29 and Lighter

Pittsburgh	3.05c
Chicago, Gary	3.05c
Granite City, Ill.	3.15c

Long Ternes No. 24 Unassorted

Pittsburgh, Gary	3.95c
Pacific Coast	4.65c

Enameling Sheets

	No. 10	No. 20
Pittsburgh	2.75c	3.35c
Chicago, Gary	2.75c	3.35c
Granite City, Ill.	2.85c	3.45c
Youngstown, O.	2.75c	3.35c
Cleveland	2.75c	3.35c
Middletown, O.	2.75c	3.35c
Pacific Coast	3.35c	3.95c

Corrosion and Heat-Resistant Alloys

Pittsburgh base, cents per lb.

Chrome-Nickel

	No. 302	No. 304
Bars	24.00	25.00
Plates	27.00	29.00
Sheets	34.00	36.00
Hot strip	21.50	23.50
Cold strip	28.00	30.00

Straight Chromes

	No. 410	No. 430	No. 442	No. 446
Bars	18.50	19.00	22.50	27.50
Plates	21.50	22.00	25.50	30.50
Sheets	26.50	29.00	32.50	36.50
Hot strip	17.00	17.50	23.00	28.00
Cold stp.	22.00	22.50	28.50	36.50

Steel Plate

Pittsburgh	2.10c
New York, del.	2.29c
Philadelphia, del.	2.15c
Boston, delivered	2.42c
Buffalo, delivered	2.33c
Chicago or Gary	2.10c
Cleveland	2.10c
Birmingham	2.10c
Coatesville, base	2.10c
Sparrows Point, base	2.10c
Claymont, del.	2.10c
Youngstown	2.10c
Gulf ports	2.45c
Pacific Coast points	2.60c

Steel Floor Plates

Chicago	3.35c
Gulf ports	3.70c
Pacific Coast ports	3.95c
Pittsburgh	3.35c

Standard Shapes

Pittsburgh	2.10c
Philadelphia, del.	2.21½c
New York, del.	2.27c
Boston, delivered	2.41c
Bethlehem	2.10c
Chicago	2.10c
Cleveland, del.	2.30c
Buffalo	2.10c
Gulf ports	2.45c
Birmingham	2.10c
St. Louis, del.	2.34c
Pacific Coast points	2.70c

Tin and Terne Plate

Tin Plate, Coke (base box)

Pittsburgh, Gary, Chicago	$5.00
Granite City, Ill.	5.10

Mfg. Terne Plate (base box)

Pittsburgh, Gary, Chicago	$4.30
Granite City, Ill.	4.40

Bars

Soft Steel

(Base, 3 to 25 tons)

Pittsburgh	2.25c
Chicago or Gary	2.25c
Duluth	2.35c
Birmingham	2.25c
Cleveland	2.25c
Buffalo	2.25c
Detroit, delivered	2.35c
Philadelphia, del.	2.57c
Boston, delivered	2.62c
New York, del.	2.59c
Gulf ports	2.60c
Pacific Coast points	2.85c

Rail Steel

To Manufacturing Trade

Pittsburgh	2.10c
Chicago or Gary	2.10c
Detroit, delivered	2.20c
Cleveland	2.10c

Buffalo	2.10c
Birmingham	2.10c
Gulf ports	2.45c
Pacific coast points	2.70c

Iron

Terre Haute, Ind.	2.15c
Chicago	2.15c
Philadelphia	2.47c
Pittsburgh, refined	3.50-8.00c

Reinforcing

New billet, straight lengths, quoted by distributors

Pittsburgh	2.05c
Chicago, Gary, Buffalo Cleve., Birm., Young., Sparrows Pt.	2.05c
Detroit, delivered	2.15c
Gulf ports	2.40c
Pacific coast ports, f.o.b. car docks	2.50c
Philadelphia, del.	2.22c

Rail steel, straight lengths, quoted by distributors

Pittsburgh, Gary, Chicago, Buffalo, Cleveland, Birmingham	1.90c
Detroit, delivered	2.00c
Gulf ports	2.25c
Pacific Coast	2.35c

Wire Products

Pitts.-Cleve.-Chicago-Birm. base per 100 lb. keg in carloads

Standard wire nails	$2.45
Cement coated nails	$2.45

(Per pound)

Polished staples	3.15c
Galv. fence staples	3.40c
Barbed wire, galv.	3.20c
Annealed fence wire	2.95c
Galv. fence wire	3.35c
Woven wire fencing (base C. L. column)	67.00
Single loop bale ties, (base C. L. column)	56.00

To Manufacturing Trade

Base, Pitts. - Cleve. - Chicago-Birmingham (except spring wire)

Bright bess., basic wire	2.60c
Galvanized wire	2.65c
Spring wire	3.20c

Worcester, Mass., $2 higher on bright basic and spring wire.

Cut nails, C. L. Pitts. (10% disc. on all extras)	$3.60

Cold-Finished Bars

	Carbon	Alloy
Pittsburgh	2.70c	3.40c
Chicago	2.70c	3.40c
Gary, Ind.	2.70c	3.40c
Detroit	2.75c	*3.50c
Cleveland	2.70c	3.40c
Buffalo	2.70c	3.40c

*Delivered.

Alloy Bars (Hot)

(Base, 3 to 25 tons)

Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem	2.80c
Detroit, delivered	2.90c

Alloy S.A.E.	Diff.	Alloy S.A.E.	Diff.
2000	0.35	3100	0.70
2100	0.75	3200	1.35
2300	1.55	3300	3.80
2500	2.25	3400	3.20

4100 0.15 to 0.25 Mo. 150-	
4600 0.20 to 0.30 Mo. 1.50- 2.00 Ni.	1.10
5100 0.80-1.10 Cr.	0.45
5100 Cr. spring flats	0.15
6100 bars	1.20
6100 spring flats	0.85
Cr. N., Van.	1.50
Carbon Van.	0.85
9200 spring flats	0.15
9200 spring rounds, squares	0.40

Electric furnace up 50 cents.

Piling

Pittsburgh	2.40c
Chicago, Buffalo	2.40c
Gulf ports	2.75c

Strip and Hoops

(Base, hot-rolled, 1 to 25 tons; cold-rolled, 3 to 25 tons)

Hot Strip, 12-inch and less

Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, Birmingham	2.15c
Detroit, del.	2.25c
Philadelphia, del.	2.47c
New York, del.	2.51c
Cooperage hoop, Youngs., Pitts., Chicago, Birm.	2.25c
Cold strip, 0.25 carbon and under, Pittsburgh, Cleveland, Youngstown	2.95c
Chicago	3.05c
Detroit, del.	3.05c
Worcester, Mass.	3.15c

Carbon	Cleve. Pitts.
0.26—0.50	2.95c
0.51—0.75	4.30c
0.76—1.00	6.15c
Over 1.00	8.35c

Worcester, Mass $4 higher.

Commodity Cold-Rolled Strip

Pitts.-Cleve.-Youngstown	3.10c
Detroit, del.	3.20c
Worcester, Mass.	3.50c

Lamp stock up 10 cents.

Rails, Fastenings

(Gross Tons)

Standard rails, mill	$40.00
Relay rails, Pittsburgh 20—100 lbs.	32.50-35.50
Light rails, billet qual., Pitts., Chicago, B'ham.	$40.00
Do., rerolling quality	39.00

Cents per pound

Angle bars, billet, mills	2.70c
Do., axle steel	2.35c
Spikes, R. R. base	3.00c
Track bolts, base	4.15c
Car axles forged, Pitts., Chicago, Birmingham	3.15c
Tie plates, base	2.15c

Base, light rails 25 to 60 lbs., 20 lbs., up $2; 16 lbs. up $4; 12 lbs. up $8; 8 lbs. up $10. Base railroad spikes 200 kegs or more; base plates 20 tons.

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade as per Dec. 1, 1932, lists, carloads 5% up; full containers additional 10%.

Carriage and Machine

½ x 6 and smaller	65-5-5 off
Do. larger, to 1-in.	60-10-5 off
Do. 1⅛ and larger	60-5-5 off
Tire bolts	50-5 off

Stove Bolts

In packages with nuts attached 75 off; in packages with nuts separate 75-12½ off; bulk 85 off on 15,000 of 3-inch and shorter, or 5000 over 3-inch.

Step bolts	50-10-5-5 off
Elevator bolts	50-10-5-5 off
Plow bolts	65-5-5 off

Nuts

Semifinished hex.	U.S.S.	S.A.E.
6-inch and less	65-5	70
⅞-1-inch	60-10	65
1⅛ and larger	60-5	60-5

Hexagon Cap Screws

Milled	50-10-5 off
Upset, 1-in., smaller	65-10 off

Square Head Set Screws

Upset, 1-in., smaller	73-10 off
Headless set screws	62-10 off

Rivets, Washers

Structural, Pittsburgh, Cleveland, Chicago	3.40c
⅞-inch and smaller, Pitts., Chi., Cleve.	65-10 off
Wrought washers, Pitts., Chi., Phila., to jobbers and large nut, bolt mfrs. l.c.l. $5.40; c.l. $5.75 off	

Welded Iron, Steel Pipe

Base discounts on steel pipe. Pitts., Lorain, O., to consumers in carloads. Gary, Ind., 2 points less on lap weld, 1 point less on butt weld. Chicago delivery 2½ and 1½ less, respectively. Wrought pipe, Pittsburgh base.

Butt Weld

Steel

In.	Blk.	Galv.
½	63½	54
¾	66½	58
1—3	68½	60½

Iron

¾	30	13
1—1¼	34	19
1½	38	21½
2	37½	21

Lap Weld

Steel

2	61	52½
2½—3	64	55½
3½—6	66	57½
7 and 8	65	55½
9 and 10	64½	55
11 and 12	63½	54

Iron

2	30½	15
2½—3½	31½	17½
4	33½	21
4½—8	32½	20
9—12	28½	15

Line Pipe

Steel

1 to 3, butt weld	67½
2, lap weld	60
2½ to 3, lap weld	63
3½ to 6, lap weld	65
7 and 8, lap weld	64
10-inch lap weld	63½
12-inch, lap weld	62½

Iron

	Blk.	Galv.
¾ butt weld	25	7
1 and 1¼ butt weld	29	13
1½ butt weld	33	15½
2 butt weld	32½	15
1½ lap weld	23½	7
2 lap weld	25½	9
2½ to 3½ lap weld	26½	11½
4 lap weld	28½	15
4½ to 8 lap weld	27½	14
9 to 12 lap weld	23½	9

Boiler Tubes

Carloads minimum wall seamless steel boiler tubes, cut lengths 4 to 24 feet; f.o.b. Pittsburgh, base price per 100 feet subject to usual extras.

Lap Welded

Sizes	Gage	Steel	Charcoal Iron
1½" O. D.	13	$ 9.72	$23.71
1¾" O. D.	13	11.06	22.93
2" O. D.	13	12.38	19.35
2¼" O. D.	13	13.79	21.68
2¼" O. D.	12	15.16	.....
2½" O. D.	12	16.58	26.57
2¾" O. D.	12	17.54	29.00
3" O. D.	12	18.35	31.36
3½" O. D.	11	23.15	39.81
4" O. D.	10	28.66	49.90
5" O. D.	9	44.25	73.93
6" O. D.	7	68.14	.....

Seamless

Sizes	Gage	Hot Rolled	Cold Drawn
1" O. D.	13	$ 7.82	$ 9.01
1¼" O. D.	13	9.26	10.67
1½" O. D.	13	10.23	11.79
1¾" O. D.	13	11.64	13.42
2" O. D.	13	13.04	15.03
2¼" O. D.	13	14.54	16.76
2½" O. D.	12	16.01	18.45
2½" O. D.	12	17.54	20.21
2¾" O. D.	12	18.59	21.42
3" O. D.	12	19.50	22.48
3½" O. D.	11	24.62	28.37
4" O. D.	10	30.54	35.20
4½" O. D.	10	37.35	43.04
5" O. D.	9	46.87	54.01
6" O. D.	7	71.96	82.93

Cast Iron Pipe

Class B Pipe—Per Net Ton

6-in., & over, Birm.	$42.00-43.00
4-in., Birmingham	45.00-46.00
4-in., Chicago	53.80-54.80
6-in. & over, Chicago	50.80-51.80
6-in. & over, east fdy.	46.00
Do., 4-in.	49.00

Class A Pipe $3 over Class B
Stnd. fitgs., Birm., base $100.00

Semifinished Steel

Rerolling Billets, Slabs

(Gross Tons)

Pittsburgh, Chicago, Gary, Cleve., Buffalo, Young., Birm., Sparrows Point	$34.00
Duluth (billets)	36.00
Detroit, delivered	36.00

Forging Quality Billets

6 x 6 to 9 x 9-in., base

Pitts., Chicago, Buffalo	40.00
Duluth	42.00

Sheet Bars

Pitts., Cleveland, Young., Sparrows Point, Buffalo, Canton, Chicago	34.00
Detroit, delivered	36.00

Wire Rods

Pitts., Cleveland, Chicago, Birmingham No. 5 to ⅝-inch incl.	43.00
Do., over ⅝ to 41/64-in. incl.	48.00

Worcester up $2; Galveston up $6; Pacific Coast up $9.

Skelp

Pitts., Chi., Young., Buff., Coatesville, Sparrows Pt.	1.90c

Coke

Price Per Net Ton

Beehive Ovens

Connellsville, fur.	$3.75
Connellsville, fdry.	4.75- 5.50
Connell. prem. fdry.	5.75- 6.25
New River fdry.	6.50- 6.75
Wise county fdry.	5.50- 5.75
Wise county fur.	4.50- 4.75

By-Product Foundry

Newark, N. J., del.	10.88-11.35
Chi., ov., outside del.	9.75
Chicago, del.	10.50
Milwaukee, ovens	10.50
New England, del.	12.50
St. Louis, del.	11.00-11.50
Birmingham, ovens	7.00
Indianapolis, del.	10.00
Cincinnati, del.	9.75
Cleveland, del.	10.30
Buffalo, del.	10.50
Detroit, del.	10.25
Philadelphia, del.	10.65

Coke By-Products

Spot, gal., freight allowed east of Omaha

Pure and 90% benzol	16.00c
Toluol, two degree	22.00c
Solvent naphtha	26.00c
Industrial xylol	26.00c

Per lb. f.o.b. Frankford and St. Louis

Phenol (200 lb. drums)	16.25c
Do. (450 lbs.)	15.25c

Eastern Plants, per lb.

Naphthalene flakes, balls, bbls. to jobbers	5.75c
Per ton, bulk, f.o.b. port	
Sulphate of ammonia	$27.75

Pig Iron

Delivered prices include switching charges only as noted. No. 2 foundry is 1.75-2.25 sil.; 25c diff. for each 0.25 sil. above 2.25 sil.; 50c diff. below 1.75 sil. Gross tons.

Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	$22.00	$22.50	$21.50	$23.00
Birdsboro, Pa.	22.00	22.50	21.50	23.00
Birmingham, Ala.‡	17.38	.....	16.38	22.00
Buffalo	21.00	21.50	20.00	22.00
Chicago	21.00	21.00	20.50	21.50
Cleveland	21.00	21.00	20.50	21.50
Detroit	21.00	21.00	20.50	21.50
Duluth	21.50	21.50	.....	22.00
Erie, Pa.	21.00	21.50	20.50	22.00
Everett, Mass.	22.75	23.25	22.25	23.75
Granite City, Ill.	21.00	21.00	20.50	21.50
Hamilton, O.	21.00	21.00	20.50	.....
Neville Island, Pa.	21.00	21.00	20.50	21.50
Provo, Utah	19.00	.....	.....	.....
Sharpsville, Pa.	21.00	21.00	20.50	21.50
Sparrow's Point, Md.	22.00	.....	21.50	.....
Swedeland, Pa.	22.00	22.50	21.50	23.00
Toledo, O.	21.00	21.00	20.50	21.50
Youngstown, O.	21.00	21.00	20.50	21.50

‡Subject to 38 cents deduction for 0.70 per cent phosphorus or higher.

Delivered from Basing Points:				
Akron, O., from Cleveland	22.39	22.39	21.89	22.89
Baltimore from Birmingham	22.78	.....	21.66	.....
Boston from Birmingham	22.87	.....	.....	.....
Boston from Everett, Mass.	23.25	23.75	22.75	24.25
Boston from Buffalo	23.25	23.75	22.75	24.24
Brooklyn, N. Y., from Bethlehem	24.50	25.00	.....	.....
Canton, O., from Cleveland	22.39	22.39	21.89	22.89
Chicago from Birminghom	†21.22	.....	.....	.....
Cincinnati from Hamilton, O.	21.24	22.11	21.61	.....
Cincinnati from Birmingham	21.06	.....	20.06	.....
Cleveland from Birmingham	21.32	.....	20.82	.....
Mansfield, O., from Toledo, O.	22.94	22.94	22.44	22.44
Milwaukee from Chicago	22.10	22.10	21.60	22.60
Muskegon, Mich., from Chicago, Toledo or Detroit	24.19	24.19	23.69	24.69
Newark, N. J., from Birmingham	23.15	.....	.....	.....
Newark, N. J., from Bethlehem	23.53	24.03	.....	.....
Philadelphia from Birmingham	22.46	.....	21.96	.....
Philadelphia from Swedeland, Pa.	22.84	23.34	22.34	.....
Pittsburgh district from Neville Island	Neville base, plus 69c, 84c, and $1.24 freight.			
Saginaw, Mich., from Detroit	23.45	23.45	22.95	22.95

	No. 2 Fdry.	Malleable	Basic	Bessemer
St. Louis, northern	21.50	21.50	21.00	.....
St. Louis from Birmingham	†21.12	.....	20.62	.....
St. Paul from Duluth	23.63	23.63	.....	24.13

†Over 0.70 phos.

Low Phos.

Basing Points: Birdsboro and Steelton, Pa., and Standish, N. Y., $26.50, base; $27.74 delivered Philadelphia.

Gray Forge		Charcoal	
Valley furnace	$20.50	Lake Superior fur.	$25.00
Pitts. dist. fur.	20.50	do., del Chicago	28.34
		Lyles, Tenn.	23.50

†Silvery

Jackson county, O., base: 6-6.50 per cent $25.50; 6.51-7—$26.00; 7-7.50—$26.50; 7.51-8—$27.00; 8-8.50—$27.50; 8.51-9—$28.00; 9-9.50—$28.50; Buffalo, $1.25 higher.

Bessemer Ferrosilicon†

Jackson county, O., base; Prices are the same as for silveries, plus $1 a ton.

†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.

Manganese differentials in silvery iron and ferrosilicon, 2 to 3%, $1 per ton add. Each unit over 3%, add $1 per ton.

Refractories

Per 1000 f.o.b. Works, Net Prices

Fire Clay Brick

Super Quality

Pa., Mo., Ky.	$60.80

First Quality

Pa., Ill., Md., Mo., Ky.	47.50
Alabama, Georgia	47.50
New Jersey	52.50

Second Quality

Pa., Ill., Ky., Md., Mo.	42.75
Georgia, Alabama	34.20
New Jersey	49.00

Ohio

First quality	39.90
Intermediate	36.10
Second quality	31.35

Malleable Bung Brick

All bases	$56.05

Silica Brick

Pennsylvania	$47.50
Joliet, E. Chicago	56.05
Birmingham, Ala.	47.50

Ladle Brick

(Pa., O., W. Va., Mo.)

Dry press	$28.00
Wire cut	$26.00

Magnesite

Imported dead - burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	$45.00
Do. domestic	40.00
Do., f.o.b. Chewelah, Wash., net ton, bulk	22.00
net ton, bags	26.00
Quickest magnesite grains, f.o.b. Chewelah, Wash., net ton, bulk	22.00

Basic Brick

Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	$47.00
Chem. bonded chrome	47.00
Magnesite brick	67.00
Chem. bonded magnesite	57.00

Fluorspar, 85-5

Washed gravel, duty paid, tide, net ton	$23.50-24.00
Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail $20, barge	$22.00
No. 2 lump	22.00-23.00

Ferroalloy Prices

Ferromanganese, 78-82%, tidewater, duty pd. $92.50; Do., del. Pittsburgh 97.77

Spiegeleisen, 19-21% dom. Palmerton, Pa., spot 28.00; Do., New Orleans 28.00; Do., 26-28%, Palmerton 33.00

Ferrosilicon, 50% freight allowed, c.l. 69.50; Do., ton lot 80.50; Do., 75 per cent 126.00; Spot, $5 a ton higher.

Silicoman, 2½ carbon 97.75; 2% carbon 102.75 1%, 112.75 Contract ton price $11 higher; spot $5 over contract.

Ferrotungsten, stand., lb. con. del. cars 1.60-1.65

Ferrovanadium, 35 to 40%, lb., cont. 2.70-2.80-2.90

Ferrophosphorus, gr. ton, c.l., 17-18% Rockdale, Tenn., basis, 18%, $3 unitage, 58.50; electrolytic, per ton, c. l., 23-26% f.o.b. Monsanto, Tenn., 24% $3 unitage 75.00

Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb., contained cr., del. carlots 10.50c; Do., ton lots 11.25c; Do., less-ton lots 11.50c

67-72% carloads, 2% carbon, per lb. contained chrome 16.50c; Do., ton lots 17.25c; Do., less-ton lots 17.75c

	Carloads	Ton lots	Less ton
2% carb.	16.50c	17.25c	17.50c
1% carb.	17.50c	18.25c	18.50c
0.10% carb.	18.50c	19.25c	19.50c
0.20% carb.	19.50c	20.25c	20.50c

Spot ¼c higher

Ferromolybdenum, 55-65% molyb. cont., f.o.b. mill, lb. 0.95

Calcium molybdate, lb. molyb. cont., f.o.b. mill 0.80

Ferrotitanium, 40-45%, lb., con. ti., f.o.b. Niagara Falls, ton lots $1.23; Do., less-ton lots 1.25; 20-25% carbon, 0.10 max., ton lots, lb. 1.35; Do, less-ton lots 1.40

Spot 5c higher

Ferrocolumbium, 50-60%, contract, lb. con. col., f.o.b. Niagara Falls $2.25; Do, less-ton lots 2.30

Spot 1s 10c higher

Technical molybdenum trioxide, 53 to 60% molybdenum, lb. molyb. cont., f.o.b. mill 0.80

Ferro-carbon-titanium, 15-18%, ti., 6-8% carb., carlots, contr., net ton $142.50; Do, spot 145.00; Do, contract, ton lots 145.00; Do, spot, ton lots 150.00

15-18% ti., 3-5% carbon, carlots, contr., net ton 157.50; Do, spot 160.00; Do, contract, ton lots 160.00; Do, spot, ton lots 165.00

Alsifer, contract carlots, f.o.b. Niagara Falls, lb. 7.50c; Do, ton lots 8.00c; Do, less-ton lots 8.50c

Spot ½c lb. higher

Chromium Briquets, contract, any quantity, freight allowed, lb. 7.25c; Do, spot carlots, bulk 7.50c; Do, ton lots 8.00c; Do., less-ton lots 8.25c

Tungsten Metal Powder, according to grade, spot shipment, 200-lb. drum lots, lb. $2.05; Do, smaller lots 2.15

Vanadium Pentoxide, contract, lb. contained $1.10; Do, spot 1.15

Chromium Metal, 98% cr., 0.50 carbon max., contract, lb. con. chrome 80.00c; Do, spot 85.00c

88% chrome, contract 79.00c; Do, spot 84.00c

Silicon Metal, 1% iron, contract, carlots, 2 x ⅛-in., lb. 14.00c; Do, 2% 12.50c

Spot ¼c higher

Silicon Briquetes, contract, carloads freight allowed, ton $69.50; Carload, spot 74.50; Less-ton lots, lb. 3.75c

Manganese Briquets, contract carloads, bulk freight allowed, lb. 4.75c; Ton lots 5.25c; Less-ton lots 5.50c

Spot ¼c higher

Zirconium Alloy, 12-15%, contract, carloads, gross ton $97.50; Do, spot 102.50

34-40%, contract, carloads, lb., alloy 14.00c; Do, ton lots 15.00c; Do, less-ton lots 16.00c

Spot ¼c higher

Molybdenum Powder, 99%, f.o.b. York, Pa. 200-lb. kegs, lb. $2.60; Do, 100-200 lb. lots 2.75; Do, under 100-lb. lots 3.00

WAREHOUSE STEEL PRICES

Base Prices in Cents Per Pound, Delivered Locally, Subject to Prevailing Differentials

	Soft Bars	Bands	Hoops	Plates ¼-in. & Over	Structural Shapes	Floor Plates	Sheets Hot Rolled	Sheets Cold Rolled	Sheets Galv. No. 24
Boston	3.98	4.21	5.21	3.85	3.85	5.66	3.86	4.93	4.76
New York (Metropolitan)	3.94	4.11	4.11	3.76	3.75	5.56	3.73	4.90	4.40
Philadelphia	3.60	3.60	4.10	3.40	3.40	5.00	3.40	....	4.50
Baltimore	3.80	3.95	4.35	3.65	3.65	5.00	3.70	5.05	4.30
Norfolk, Va.	4.00	4.15	4.55	3.85	3.85	5.20	3.90	4.80	5.40
Buffalo	3.60	3.97	3.97	3.77	3.55	5.40	3.50	4.55	4.40
Pittsburgh	3.60	3.75	3.75	3.55	3.55	5.15	3.50	4.60	4.50
Cleveland	3.50	3.65	3.65	3.55	3.73	5.33	3.50	4.70	4.62
Detroit	3.68	3.83	3.83	3.75	3.80	5.42	3.58	4.65	4.74
Cincinnati	3.85	3.82	3.82	3.80	3.83	5.43	3.57	....	4.57
Chicago	3.60	3.75	3.75	3.55	3.55	5.15	3.50	4.45	4.50
Minneapolis	3.85	4.00	4.00	3.80	3.80	5.40	3.75	5.10	4.75
Milwaukee	3.73	3.88	3.88	3.68	3.68	5.28	3.63	4.58	4.63
St. Louis	3.87	4.02	4.02	3.82	3.82	5.42	3.77	4.72	4.77
Kansas City	4.15	4.30	4.30	4.10	4.10	5.70	4.10	....	4.75
Memphis	4.01	4.16	4.16	3.96	3.96	5.71	3.91	....	5.26
Chattanooga	3.90	4.05	4.05	3.85	3.85	5.80	3.80	....	4.40
Tulsa, Okla.	4.64	4.79	4.79	4.59	4.59	6.19	4.54	....	5.54
Birmingham, Ala.	3.50	3.65	3.65	3.45	3.45	5.83	3.40	....	4.75
New Orleans	3.85	4.65	4.65	3.80	3.80	5.75	4.10	....	4.60
Houston, Tex.	3.50	5.85	6.25	4.05	4.05	5.65	3.95	....	5.25
Seattle	4.30	4.50	5.85	4.05	4.15	5.90	4.20	....	5.50
Portland, Oreg.	4.30	4.70	6.10	4.15	4.15	5.90	3.75	6.50	4.75
Los Angeles	4.00	4.50	6.35	4.00	4.00	6.20	4.20	6.30	5.05
San Francisco	4.05	4.45	6.00	4.00	4.00	5.60	4.00	6.40	5.15

	Cold Rolled Strip	Cold Finished Bars	SAE Hot-rolled Bars (Unannealed) 1035-1050	2300 Series	3100 Series	4100 Series	6100 Series	SAE Cold Drawn Bars 2300	SAE Cold Drawn Bars 3100
Boston	3.61	4.43	4.28	7.65	6.25	6.00	8.05	8.73	7.33
New York	3.66	4.39	4.14	7.50	6.10	5.85	....	8.69	7.29
Philadelphia	3.66	4.36	3.85	7.46	6.06	5.81	8.71	....	....
Baltimore	....	4.35	3.95	....	....	....	....	....	....
Norfolk, Va.	....	4.60	....	....	....	....	....	....	....
Buffalo	3.57	4.05	3.80	7.25	5.85	5.60	7.65	8.25	6.85
Pittsburgh	3.35	3.95	3.80	7.35	5.95	5.70 *	7.75	8.35	6.95
Cleveland	3.35	4.05	3.70	7.45	6.05	6.05	7.85	8.25	6.85
Detroit	3.55	4.10	3.83	7.57	6.17	5.92	7.30	8.55	7.15
Cincinnati	3.60	4.30	3.90	7.59	6.19	5.94	8.99	8.60	7.20
Chicago	3.65	4.05	3.80	7.25	5.85	5.60	7.65	8.25	6.85
Minneapolis	....	4.64	4.00	7.60	6.20	8.79	9.34	8.94	7.54
Milwaukee	....	4.18	3.93	7.48	6.08	5.85	7.88	8.48	7.08
St. Louis	3.76	4.32	4.07	7.62	6.22	5.97	8.02	8.62	7.22
Kansas City	4.46	4.60	....	....	....	....	....	....	....
Memphis	....	4.61	....	....	....	....	....	....	....
Chattanooga	....	4.90	....	....	....	....	....	....	....
Tulsa, Okla.	....	5.09	....	....	....	....	....	....	....
Birmingham, Ala.	....	4.73	....	....	....	....	....	....	....
New Orleans	5.00	5.10	....	....	....	....	....	....	....
Seattle	....	5.60	5.65	....	7.80	7.65	8.45	....	....
Portland, Oreg.	....	5.60	6.10	9.00	8.00	7.85	8.70	....	....
Los Angeles	4.45	6.00	4.65	9.40	8.55	8.40	9.05	10.40	9.55
San Francisco	*9.30	6.55	5.20	9.65	8.80	8.65	9.30	10.65	9.80

* Based on minimum quantity.

CURRENT IRON AND STEEL PRICES OF EUROPE

Dollars at Rates of Exchange, Jan. 5

Export Prices f. o. b. Port of Dispatch—

By Cable or Radio

	British gross tons U. K. ports	Quoted in dollars at current value	Continental Channel or North Sea ports, gross tons **Quoted in gold pounds sterling
	£ s d		£ s d
Foundry, 2.50-3.00 Si.	$23.20 5 0 0	$17.04	2 0 0
Basic bessemer	.....	15.98	1 17 6
Hematite, Phos. .03-.05	26.68 5 15 0*	.....	.....
Billets	$34.22 7 7 6	$42.60	5 0 0
Wire rods, No. 5 gage	52.32 11 5 6	43.66	5 2 6
Standard rails	$47.08 9 10 0	$48.99	5 15 0
Merchant bars	2.28c 11 0 0	2.00c to 2.05c	5 2 6 to 5 5 0
Structural shapes	2.20c 10 12 6	1.90c	4 17 6
Plates, †¼ in. or 5 mm.	2.39c 11 11 3	2.19c to 2.39c	5 12 6 to 6 2 6
Sheets, black, 24 gage or 0.5 mm.	2.69c 13 0 0	2.93c	7 10 0°
Sheets, gal., 24 ga., corr.	3.26c 15 15 0	3.51c	9 0 0
Bands and strips	2.74c 13 5 0	2.05c	5 5 0
Plain wire, base	4.04c 19 10 0	2.39c to 2.83c	6 2 6 to 7 5 0
Galvanized wire, base	4.79c 23 5 0	3.07c to 3.17c	7 17 6 to 8 2 6
Wire nails, base	3.83c 18 10 0	2.73c to 2.93c	7 0 0 to 7 10 0
Tin plate, box 108 lbs.	$ 4.70 1 0 3	.....	.....

British ferromanganese $92.50 delivered Atlantic seaboard duty-paid.

Domestic Prices at Works or Furnace—

Last Reported

	£ s d	French Francs		Belgian Francs		Reich Mark
Fdy. pig iron, Si. 2.5	$25.29 5 9 0(a)	$15.79	598	$16.85	500	$25.28 63
Basic bess. pig iron	23.20 5 0 0(a)	.....	...	.....	...	27.88 (b)69.50
Furnace coke	6.38 1 7 6	5.92	225	7.25	215	7.62 19
Billets	36.54 7 17 6	22.09	840	28.98	860	38.72 96.50
Standard rails	2.10c 10 2 6	1.38c	1,150	2.06c	1,375	2.38c 132
Merchant bars	2.53c 12 4 0††	1.30c	1,080	1.65c	1,100	1.98c 110
Structural shapes	2.28c 11 0 6††	1.27c	1,055	1.65c	1,100	1.93c 107
Plates, †¼-in. or 5 mm.	2.42c 11 14 3††	1.62c	1,350	2.06c	1,375	2.29c 127
Sheets, black	3.26c 15 15 0§	1.92c	1,600‡	2.36c	1,575‡	2.59c 144‡
Sheets, galv., corr., 24 ga. or 0.5 mm.	3.83c 18 10 0	2.70c	2,250	4.13c	2,750	6.66c 370
Plain wire	4.04c 19 10 0	1.98c	1,650	2.48c	1,650	3.11c 173
Bands and strips	2.68c 12 19 0††	1.45c	1,210	1.95c	1,300	2.29c 127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continent usually for basic-bessemer steel. (a) del. Middlesbrough. 5s rebate to approved customers. (b) hematite. °Close annealed. ††Rebate of 15s on certain conditions.

**Gold pound sterling carries a premium of 75 per cent over paper sterling.

IRON AND STEEL SCRAP PRICES

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated; † indicates brokers prices

HEAVY MELTING STEEL

Birmingham, No. 1	†12.00
Bos. dock No. 1 exp.	13.50-13.75
New Eng. del. No. 1	14.00
Buffalo, No. 1	13.75-14.25
Buffalo, No. 2	11.75-12.25
Chicago, No. 1	13.50-14.00
Chicago, auto, no alloy	12.00-12.50
Chicago, No. 2 auto	11.00-11.50
Cincinnati, dealers	11.50-12.00
Cleveland, No. 1	13.50-14.00
Cleveland, No. 2	12.50-13.00
Detroit, No. 1	10.00-10.50
Detroit (industrial)	10.50-11.00
Eastern Pa., No. 1	15.00-15.50
Eastern Pa., No. 2	13.00-13.50
Federal, Ill.	12.00-12.50
Granite City, R. R.	12.50-13.00
Granite City, No. 2	12.00-12.50
Los Angeles, No. 1	12.00-12.50
Los Angeles, No. 2	11.00-11.50
N. Y. dock No. 1 exp.	11.50-12.00
Pitts., No. 1 (R.R.)	16.00-16.50
Pittsburgh, No. 1	15.50-16.00
Pittsburgh, No. 2	14.50-15.00
St. Louis, R. R.	13.00-13.50
St. Louis, No. 2	12.00-12.50
San Francisco, No. 1	12.00
Seattle, No. 1	14.00
Toronto, dlrs. No. 1	10.00-11.00
Valleys, No. 1	14.50-15.00

COMPRESSED SHEETS

Buffalo	11.75-12.25
Chicago, factory	12.50-13.00
Chicago, dealer	11.50-12.00
Cincinnati, del.	11.00-11.50
Cleveland	13.00-13.50
Detroit	11.50-12.00
E. Pa., new mat.	15.50
E. Pa., old mat.	11.00-11.50
Los Angeles	12.50-13.00
Pittsburgh	15.50-16.00
St. Louis	10.00-10.50
Valleys	14.00-14.50

BUNDLED SHEETS

Buffalo, No. 1	12.00-12.50
Buffalo, No. 2	11.00-11.50
Cleveland	10.00-10.50
Los Angeles	14.00
Pittsburgh	14.50-15.00
St. Louis	7.50- 8.00
Toronto, dealers	4.00

SHEET CLIPPINGS, LOOSE

Chicago	8.50- 9.00
Cincinnati, dealers	7.00- 7.50
Detroit	8.50- 9.00
†Los Angeles	3.75- 4.00
St. Louis	7.00- 7.50

BUSHELING

Buffalo, No. 1	11.75-12.25
Chicago No. 1	12.50-13.00
Cincin., No. 1, deal.	8.00- 8.50
Cincinnati, No. 2	3.50- 4.00
Cleveland, No. 2	7.25- 7.75
Detroit, No. 1, new	9.75-10.25
Valleys, new, No. 1	13.50-14.00
Toronto, dealers	4.00

MACHINE TURNINGS (Long)

Birmingham	†4.50- 5.00
Buffalo	7.00- 7.50
Chicago	7.00- 7.50
Cincinnati, dealers	4.75- 5.25
Cleveland	7.00- 7.50
Detroit	5.50- 6.00
Eastern Pa.	9.00- 9.50
Los Angeles	4.50- 4.75
New York	†3.50- 4.00
Pittsburgh	9.50-10.00
St. Louis	3.00- 4.00
Toronto, dealers	4.25- 4.75
Valleys	8.50- 9.00

SHOVELING TURNINGS

Buffalo	7.50- 8.50
Cleveland	7.50- 8.00
Chicago	8.50- 9.00
Detroit	6.50- 7.00
Pitts., alloy-free	11.25-11.75

BORINGS AND TURNINGS

For Blast Furnace Use

Boston district	2.00
Buffalo	7.25- 7.75
Cincinnati, dealers	3.50- 4.00
Cleveland	7.50- 8.00
Eastern Pa.	6.50- 7.00
Detroit	5.50- 6.00
New York	†2.50- 3.00
Pittsburgh	8.25- 8.75
Toronto, dealers	3.50

AXLE TURNINGS

Boston district	†7.50
Buffalo	9.50-10.00
Chicago, elec. fur.	13.00-13.50
East. Pa., elec. fur.	13.00-13.50
St. Louis	9.00- 9.50
Toronto	5.00

CAST IRON BORINGS

Birmingham	†6.00- 6.50
Boston dist. chem.	†6.00- 6.25
Buffalo	7.75- 8.25
Chicago	5.50- 6.00
Cincinnati, dealers	3.50- 4.00
Cleveland	7.25- 7.75
Detroit	5.50- 6.00
E. Pa., chemical	10.00-11.00
New York	†3.50- 4.00
St. Louis	2.50- 3.00
Toronto, dealers	3.50

RAILROAD SPECIALTIES

Chicago	15.75-16.25

ANGLE BARS—STEEL

Chicago	15.50-16.00
St. Louis	14.00-14.50

SPRINGS

Buffalo	16.00-16.50
Chicago, coil	17.00-17.50
Chicago, leaf	16.00-16.50
Eastern Pa.	17.00-17.50
Pittsburgh	16.75-17.25
St. Louis	15.00-15.50

STEEL RAILS, SHORT

Birmingham	†12.00-12.50
Buffalo	17.00-17.50
Chicago (3 ft.)	15.50-16.00
Chicago (2 ft.)	16.75-17.25
Cincinnati, dealers	16.75-17.25
Detroit	16.50-17.00
Los Angeles	15.00-15.50
Pitts., 3 ft. and less	16.75-17.25
St. Louis, 2 ft. & less	16.25-16.75

STEEL RAILS, SCRAP

Boston district	†13.50-14.00
Buffalo	16.00-16.50
Chicago	14.00-14.50
Cleveland	17.00-17.50
Pittsburgh	16.25-16.75
St. Louis	14.00-14.50
Seattle	16.00

FROGS, SWITCHES

Chicago	13.50-14.00
St. Louis, cut	14.25-14.75

ARCH BARS, TRANSOMS

St. Louis	14.00-14.50

PIPE AND FLUES

Chicago, net	9.50-10.00
Cincinnati, dealers	7.25-7.75

RAILROAD GRATE BARS

Buffalo	10.00-10.50
Chicago, net	9.00- 9.50
Cincinnati, dealers	7.00- 7.50
Eastern Pa.	13.50-14.00
New York	†8.50- 9.00
St. Louis	9.50-10.00

RAILROAD WROUGHT

Birmingham	†11.00-11.50
Boston district	†9.50-10.00
Eastern Pa., No. 1	15.50-16.00
St. Louis, No. 1	10.75-11.25
St. Louis, No. 2	12.50-13.00
Toronto, No. 1 dlr.	10.00

FORGE FLASHINGS

Boston district	†8.00- 8.25
Buffalo	11.75-12.25
Cleveland	11.50-12.00
Detroit	9.50-10.00
Los Angeles	9.00
Pittsburgh	14.50-15.00

FORGE SCRAP

Boston district	†6.50
Chicago, heavy	16.50-17.00

LOW PHOSPHORUS

Buffalo, crops	16.50-17.00
Cleveland, crops	18.00-18.50
Eastern Pa., crops	17.00-17.50
Pitts., billet, bloom, slab crops	18.50-19.00

LOW PHOS. PUNCHINGS

Buffalo	15.50-16.00
Chicago	16.00-16.50
Eastern Pa.	17.00-17.50
Pittsburgh	17.25-17.75
Seattle	15.00

RAILS FOR ROLLING

5 feet and over

Birmingham	†14.00-15.00
Boston	15.00-15.50
Chicago	17.50-18.00
New York	†14.50-15.00
Eastern Pa.	17.00-17.50
St. Louis	18.00-18.50

STEEL CAR AXLES

Birmingham	†15.00-16.00
Buffalo	16.50-17.00
Boston district	†16.00
Chicago, net	19.00-19.50
Eastern Pa.	21.50-22.50
St. Louis	19.00-19.50

LOCOMOTIVE TIRES

Chicago (cut)	16.00-16.50
St. Louis, No. 1	13.50-14.00

SHAFTING

Boston district	†14.75-15.00
New York	†15.50-16.00
Eastern Pa.	20.50-21.00
St. Louis, 1¼-3¾"	17.00-17.50

CAR WHEELS

Birmingham	†13.50-14.00
Boston dist., iron	†11.00
Buffalo, steel	16.50-17.00
Chicago, iron	13.50-14.00
Chicago, rolled steel	15.50-16.00
Cincin., iron, deal.	13.50-14.00
Eastern Pa., iron	16.50-17.00
Eastern Pa., steel	17.00-17.50
Pittsburgh, iron	15.00-15.50
Pittsburgh, steel	16.75-17.25
St. Louis, iron	14.00-14.50
St. Louis, steel	15.00-15.50

NO. 1 CAST SCRAP

Birmingham	†12.50-13.00
Boston, No. 1 mach.	†11.00-11.50
N. Eng. del. No. 2	12.00-12.50
N. Eng. del. textile	12.50-13.00
Buffalo, cupola	14.50-15.00
Buffalo, mach.	15.50-16.00
Chicago, agri. net	10.50-11.00
Chicago, auto net	12.00-12.50
Chicago, railr'd net	11.00-11.50
Chicago, mach. net	12.00-12.50
Cincin., mach. deal.	13.50-14.00
Cleveland, mach. net	16.75-17.25
Eastern Pa., cupola	16.50-17.00
E. Pa., mixed yard	14.50-15.00
Los Angeles, net	13.50-14.00
Pittsburgh, cupola	15.25-15.75
San Francisco, del.	13.50-14.00
Seattle	10.00-12.00
St. Louis, cupola	12.50-13.00
St. Louis, agri. mach.	14.50-15.00
St. L., No. 1 mach.	15.00-15.50
Toronto, No. 1, mach., net	11.00-12.00

HEAVY CAST

Boston dist. break.	†10.75-11.00
New England, del.	12.50-13.00
Buffalo, break.	11.00-11.50
Cleveland, break, net	13.00-13.50
Detroit, auto net	13.00-13.50
Detroit, break	9.50-10.00
Eastern Pa.	15.50-16.00
Los Ang., auto, net.	13.00-13.50
New York, break.	†11.50-12.00
Pittsburgh, break	13.25-13.75

STOVE PLATE

Birmingham	†7.50- 8.00
Boston district	†8.00- 8.25
Buffalo	13.00-13.50
Chicago, net	8.50- 9.00
Cincinnati, dealers	7.00- 7.50
Detroit, net	8.50- 9.00
Eastern Pa.	13.50
New York, fdy.	†10.00-10.50
St. Louis	9.00- 9.50
Toronto dealers, net	7.50- 8.00

MALLEABLE

Birmingham, R. R.	†10.50-11.00
New England, del.	14.50-15.00
Buffalo	13.50-14.00
Chicago, R. R.	15.00-15.50
Cincin., agri. deal.	12.00-12.50
Cleveland, rail	15.00-15.50
Eastern Pa., R. R.	16.00-16.50
Los Angeles	17.50-18.00
Pittsburgh, rail	14.25-14.75
St. Louis, R. R.	12.00-13.00

Iron Ore

Lake Superior Ore

Gross ton, 51½%

Lower Lake Ports

Old range bessemer	$5.25
Mesabi nonbes.	4.95
High phosphorus	4.85
Mesabi bessemer	5.10
Old range nonbes.	5.10

Eastern Local Ore

Cents, unit, del. E. Pa.

Foundry and basic 56.63% con.	9.00-9.25
Cop.-free low phos. 58-60%	nominal

Foreign Ore

Cents per unit, c.i.f. Atlantic

Foreign manganiferous ore, 45.55% iron, 6-10% man. nom.	12.00
No. Afr low phos.	12.50-13.00
Swedish low phos.	12.50-13.00
Spanish No. Africa basic, 50 to 60% nom.	11.00
Tungsten. sh. ton. unit, duty pd. nom.	19.00
N. F., fdy., 55%	7.00
Chrome ore, 48% gross ton, c.i.f.	$23.00-24.00
Molybdenum ores sulphide, per lb. molybdenum contained, f.o.b. mill	0.75

Manganese Ore

Prices not including duty, cents per unit cargo lots.

Caucasian, 50-52% nom.	30.00-31.00
So. African, 50-52% nom.	30.00-31.00
Indian, 49-50%	29.00-30.00

Sheets, Strip

Sheet and Strip Prices, Pages 60, 61

Pittsburgh — Sheet and strip production has rebounded from the depressed holiday level, supported by a continuation of automotive buying and prospects for additional purchases shortly. Orders from miscellaneous consumers are spotty, while jobber demand generally is heavier. Fair releases are being received from farm equipment manufacturers. Sellers are optimistic. Backlogs of automotive steel will bolster operations in coming weeks and prospects for increasing demand elsewhere are regarded as good. Prices are steady although they have been tested by only relatively small orders since last fell.

Cleveland—Specifications against old orders for sheets and strip increased with the turn of the year, but renewed buying of large lots by automotive interests is not looked for until late January. Most consumers are well stocked as a result of extensive forward buying last quarter, although active consumption will stimulate the placing of new business in the near future.

Chicago—New orders are appearing for sheets and strip, but volume is restricted by previous coverage by many leading consumers. Shipment against low-price orders is expected to be completed within the next two to three weeks. Prices are firm on new business, but a better test will be provided when automotive interests enter the market for larger tonnages.

New York — Sheet specifications are expanding with the near completion of inventory-taking. Demand is for prompt consumption as well as stock replenishment, with rush shipment requested occasionally. Best releases are coming from makers of household appliances.

Philadelphia — Sheet buying shows some improvement, with further gains in prospect. Low stocks of consumers aid the outlook. Releases by household appliance makers are fairly good.

Buffalo — Diversified demand is holding sheet and strip production at a relatively high rate. New business still is light, since shipments continue against old orders. Automotive releases have tapered moderately.

St. Louis — Sheet deliveries continue active, with one producer increasing its rolling schedule this month. Backlogs are reported good, but some new business, including railroad orders, is expected within the next few weeks.

Birmingham, Ala. — No perceptible slackening is evident in production of sheets. Mills here and at Gadsden continue at 100 per cent with roofing sheets probably leading by a slight margin. Manufacturers' sheets continue in satisfactory volume, but strip is virtually at a standstill.

Plates

Plate Prices, Page 60

Cleveland — Plate sales improved moderately last week, although in some instances gains were slightly less than anticipated. Inquiries are more active. Prices are firm.

Chicago — Freight car building and subway work are helping plate orders, while fabricators are fairly well occupied by various PWA projects involving waterworks and pipe systems. Fabrication of storage tanks and oil refining equipment is expected to tend upward early this year.

New York—Plate sellers look for stock replenishment by jobbers and consumers to provide demand its first upturn of the new year. Little immediate improvement in consumption is in sight, but the outlook is encouraging. Prospects for better railroad buying are aided by unconfirmed reports that the Pennsylvania will start an extensive repair program within the next month or two. Little new shipbuilding is being figured, but a substantial tonnage for boats already awarded is said to be still pending. Good specifications for oil refinery needs are expected this quarter.

Philadelphia — Business is dull and while the long-term outlook is regarded favorable, little immediate improvement is seen except for some replacement buying after the inventory season. Seven hundred tons of 20-inch steel pipe for Bethlehem, Pa., went to Bethlehem Steel Co. Low bids on over 1000 tons of 42-inch pipe for Harrisburg, Pa., were rejected. The latter may e readvertised.

Birmingham, Ala. — Output of plates is estimated at around 60 per cent with much attributable to railroad car business. Some miscellaneous demand is evident, however, and indications are for a good first quarter.

Seattle—Largest contract pending totals 1200 tons for the Puget Sound navy yard gate-caisson, awarded Winslow Marine Railway & Shipbuilding Co., Seattle. Bethlehem Steel Co. will furnish 800 tons for the government steamer EXPLORER, and Steel Tank & Pipe Co., Portland, will fabricate 411 tons for 24 to 42-inch water pipe for Tacoma. C. C. Moore Co., San Francisco, is low to navy department at $175,640 for building a 125,000-pound boiler, superheaters and accessories for Puget Sound navy yard, tonnage unstated.

Plate Contracts Placed

800 tons, government steamer Explorer, to Bethlehem Steel Co., Seattle; Lake Washington Shipyards, Seattle, general contractor.

411 tons, 24 to 42-inch water pipe, Tacoma, Wash., to Steel Tank & Pipe Co., Portland.

Plate Contracts Pending

1200 tons, caisson for graving dock, Puget Sound Navy yard, Winslow Marine Railway & Shipbuilding Co., Seattle, general contractor.

180 tons, 140-foot tanker for Petroleum Navigation Co., Seattle; bids to C. J. Nordstrom, marine architect, Seattle, Jan. 11.

Bars

Bar Prices, Page 60

Cleveland — Specifications are moderately heavier, following curtailed demand late in December. Auto partsmakers continue fairly active, while business from farm equipment builders shows encouraging gains. Inventories of most consumers are relatively low.

Chicago — Carbon and alloy bar demand has yet to recover fully from year-end curtailment, although business is described as good. Automotive, farm equipment and tractor orders are expected to be the chief factor in supporting bar demand this quarter. Production in some instances is running slightly ahead of shipments.

New York — A revival in bar buying is anticipated now that inventory-taking is practically over. Stocks of both jobbers and consumers are the lowest in months, hence some replacement buying is indicated. Specifications from automotive interests and government shops already are heavier. Railroad demand is more promising, though little tonnage now is being figured. Active specifications from bolt and nut makers last month are expected to retard additional releases for the present.

Philadelphia — Commercial bar business is increasing moderately, principally for stock replacement. While demand still is widely diversified, inroads of light flat steel at the expense of bars continue noticeable in some lines.

Buffalo — While bar demand from the automotive industry has tapered, production is steady and

fairly heavy, partly because buying for structural purposes is expanding. Activity in concrete reinforcing material is aiding bar mill operations.

Birmingham, Ala. — Although the hoidays had some adverse effect upon output of bars, demand is well maintained with production at about 60 per cent. Manufacturers of agricultural implements are actively in the market.

Pipe

Pipe Prices, Page 61

Cleveland — Movement of steel pipe through jobbers has increased moderately, with additional gains in sight this month. Toledo, O., plans a water intake requiring about 2000 tons of 42-inch steel pipe, while Detroit is inquiring for 800 tons of 72-inch. Cast pipe inquiries from small municipalities have subsided somewhat, but additional work will be up for bids later this month.

Birmingham, Ala.—Some increase in lettings of cast iron pipe is evident after hesitancy during the closing days of the old year. Makers remain optimistic as to prospects for the year's aggregate tonnage, but report nothing individually large thus far.

Seattle—Principal award is 1500 tons of 12, 16 and 20-inch cast pipe for Tacoma, Wash. For the same project 100 tons of gate valves has been placed. Corvallis, Oreg., with bids in for 2300 tons of 16 and 20-inch cast pipe, is expected to contract for steel mains. Hazlewood, Oreg., is reported ready to place orders for transite pipe, bids for 500 tons of cast iron having been submitted.

Cast Pipe Placed

1500 tons, 12 to 20-inch, Tacoma, Wash., to United States Pipe & Foundry Co., Burlington, N. J., through H. G. Purcell, Seattle; 100 tons, gate valves and fittings to Pacific Water Works Supply Co., Seattle.

100 tons, system improvement, St. Charles, Idaho, to Pacific States Cast Iron Pipe Co., Provo, Utah.

Cast Pipe Pending

100 tons, Washington state WPA; bids in at Yakima, Wash.

Steel Pipe Pending

2000 tons, 42-inch, new intake and miscellaneous work, city of Sandusky, O.; bids soon.

800 tons, 72-inch, Detroit; bids Jan 6, with cast iron, concrete alternates.

Rails, Cars

Track Material Prices, Page 61

Domestic freight car awards in December involved 2581 units and brought the total for the year to 16,303, compared with 57,611 in 1937. Comparisons follow:

	1938	1937	1936	1935
Jan.	25	17,806	2,050	24
Feb.	109	4,972	6,900	806
March....	680	8,155	632	0
April.....	15	9,772	4,427	350
May.....	6,014	4,732	8,900	2
June	1,178	548	5,200	5,151
July.....	0	1,030	7,229	500
Aug.	182	1,475	225	200
Sept.	1,750	1,216	1,750	875
Oct.	2,537	1,355	2,210	1,250
Nov.	1,232	275	1,550	100
Dec.	2,581	275	23,450	10,050
Total...	16,303	51,611	64,523	19,308

Still pending, and the only outstanding domestic inquiry active at present, is the list of 1000 hopper cars for the Illinois Central. Announcement of this award is expected momentarily. However, Canadian National is inquiring for 2000 box cars, an inquiry which is attracting the interest of American builders with Canadian affiliates. This carrier is also asking bids on 10 baggage cars and five mail and express cars, one ballast spreader, and three cranes of locomotive type. This carrier also plans to build some caboose and refrigerator cars in its own shops during the current year.

Norfolk & Western will build 10 Y-6 Mallet type freight engines in its Roanoke, Va. shops. Northern Pacific has distributed 30,000 tons of rails among several producers. Union Pacific will install air-conditioning equipment in 74 passenger cars in its Omaha shops.

Locomotives Placed

Norfolk & Western, 10 Y-6 Mallet type freight engines, to its Roanoke, Va. shops.

Rail Orders Placed

Northern Pacific, 30,000 tons; Carnegie-Illinois Steel Corp., 20,000 tons, Bethlehem Steel Co., 9000 tons, Inland Steel Co., 500 tons, Colorado Fuel & Iron Corp., 500 tons.

Car Orders Pending

Canadian National, 2000 box cars, 10 baggage and five mail and express cars, one ballast spreader and three cranes of locomotive type, pending; plans construction of caboose cars and refrigerator cars in its own shops during the current year.

Semifinished

Semifinished Prices, Page 61

Pittsburgh — Semifinished steel demand, recently at about the December rate, is expected to be more active soon. Releases from nonintegrated consumers largely are for sheet bars and billets, although skelp demand is fair. Little stocking is apparent on the part of consumers or producers, indicating expectations of steady consumption in the near future. Operations remain far below capacity.

Wire

Wire Prices, Page 61

Cleveland — Manufacturers' wire and wire rod demand continues sustained by fair activity among automotive suppliers and miscellaneous consumers. Jobbers serving agricultural districts are specifying wire products more freely, with this trend expected to be furthered the next 60 days. In contrast to the situation a year ago, distributors' stocks are relatively low.

Philadelphia — Nail prices have stiffened here following recent concessions. However, many buyers covered on near future requirements at low figures and little new buying is expected this month. Other wire products are steady.

Birmingham, Ala. — Considerable restocking of wire products by jobbers and retailers has had quite a beneficial effect on production. Mills estimate output at something better than 60 per cent.

Tin Plate

Tin Plate Prices, Page 60

Tin plate operations were affected but little over the year-end and continue about 40 per cent. Demand has yet to appear in large volume for packers' cans, being heaviest for miscellaneous manufacturing lines. Spring buying for the former still is several weeks off.

Sellers expect to see the heaviest releases this quarter since last summer, with business much better than a year ago though less active than in the first quarter of 1937. Export demand continues to lag, although some fair shipments are moving to South America where summer canning is getting under way.

Ferroalloys

Ferroalloy Prices, Page 62

New York — Ferromanganese shipments this month are expected to be slightly better than in December, but there is some question whether the quarter as a whole will show improvement over the fourth period. Prices of ferromanganese, spiegeleisen and other leading ferroalloys are unchanged.

Shapes

Structural Shape Prices, Page 60

Pittsburgh — Volume of new projects has dwindled although the placement list is holding steady. A few of the recent jobs are privately financed, although most are public works projects. A bridge over the Elk river, Charleston, W. Va., requiring 800 tons, went to Mt. Vernon Bridge Co., Mt. Vernon, O.

Cleveland — Private work is light and little improvement is expected through January. While a number of awards are reported from public sources, individual tonnages are comparatively small. However, the outlook is considerably brighter with two bridges at Lorain, involving 9000 tons, scheduled to come up for bids soon; two others at Youngstown, requiring 1800 tons and 3500 tons for two vertical lift bridges in connection with the Cuyahoga river improvement project, Cleveland. Fabricated prices are weak.

Chicago — Fabricated shape inquiries and awards are lighter because of the letdown in activity over the holidays. Prospective business remains heavy, however, and no immediate letdown in demand is seen. Outstanding among new jobs is 1500 tons for a music hall, Purdue university, West Lafayette, Ind.

M. J. Boyle & Co., Chicago, is reported low for the general contract on the second section of the Chicago subway, involving 3000 tons of liner plates and beam ribs, 2750 tons of concrete bars and 225 tons of structural shapes.

Philadelphia — Award of 1500 tons to a local fabricator for a power house for the consolidated Gas & Electric Light Co., Baltimore, features structural business here. The outstanding inquiry involved 3000 tons for a hospital, Richmond, Va. While total structural business is light, fabricators are figuring on considerable work, including an increasing amount of private construction. Approximately 2000 tons of caissons piling for Cape May bridges, N. J., have been placed with an eastern mill.

Buffalo — Although only a few inquiries appeared recently, steel fabricators are anxiously awaiting the release of numerous projects. Two schools at Lockport, N. Y., one calling for 235 tons, the other 200 tons, were awarded to Ernst Iron Works, Buffalo. Fabricators generally anticipate a much better year than experienced in 1938.

St. Louis — Outlook during the next few weeks is fairly good. Pending projects include about 1200 tons for highway bridges. The largest of these is a span at Wyandotte, Kans., requiring 712 tons, for which the J. T. Tobin Construction Co., Kansas City, Mo., is general contractor. Operations at fabricating yards are at about 35 per cent of capacity.

Birmingham, Ala. — Although reflecting to considerable extent the effect of the holiday season, shapes are being turned out in comparatively satisfactory volume. Most business is for government use.

Seattle — Awards include 400 tons of steel piling and 400 tons of shapes awarded to Bethlehem Steel Co., Seattle. Northwest Equipment Co., Vancouver, Wash., is fabricating 368 tons for the Lewis river bridge, Washington state, previously reported unstated.

Shape Contracts Placed

15,500 tons, transmission towers, bureau of light and power, Los Angeles, to Bethlehem Steel Co., Bethlehem, Pa.

6800 tons, Jamestown-Narragansett bridge, Rhode Island, to Harris Structural Steel Co., New York.

2500 tons, bureau of yards, assembly and repair shop, Alameda, Calif., to Bethlehem Steel Co., Bethlehem, Pa.

2000 tons, piling, bridges, Cape May, N. J., to Bethlehem Steel Co., Bethlehem, Pa.; includes 800 tons of cassions.

1800 tons, infirmary, building No. 93, Kings Park, Long Island, to American Bridge Co., Pittsburgh.

1700 tons, bridge over Missouri river, Rulo, Nebr., for Richardson county, Nebraska, to Omaha Steel Works, Omaha, Nebr.

1500 tons, power house, for the Consolidated Gas & Electric Light Co., Baltimore, to Belmont Iron Works, Philadelphia.

930 tons, Family Court building, Twenty-second street and Lexington avenue, New York, to Harris Structural Steel Co., that city.

806 tons, bridge, over Elk river, Charleston, W. Va., to Mt. Vernon Bridge Co., Mt. Vernon, O.

625 tons, extension building No. 1, Marine hospital, Stapleton, Staten island, to Bethlehem Fabricators, Bethlehem, Pa.

580 tons, laboratory, University of Maryland, Baltimore, to Bethlehem Fabricators, Bethlehem, Pa.

575 tons, state bridge over Des Moines river, Des Moines, Iowa, to Pittsburgh-Des Moines Steel Co., Pittsburgh.

475 tons, Moosup river bridge, Plainfield, Conn., to American Bridge Co., Pittsburgh.

475 tons, hospital, Dannemore, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.

440 tons, municipal building, Wilkinsburg, Pa., to Fort Pitt Bridge Works, Pittsburgh.

400 tons, survey steamer for government, to Bethlehem Steel Co., Seattle; Lake Washington Shipyards, Seattle, general contractor.

400 tons, field house, Utah state agricultural college, Logan, Utah, to Bethlehem Steel Co., Bethlehem, Pa.

393 tons, Umpque river, Oregon state bridge, to unstated Portland interests; C. J. Montag, general contractor.

368 tons, Lewis river state bridge, Washington state, to Northwest Equipment Co., Vancouver, Wash.; previously reported unstated.

360 tons, state hospital buildings, Southbury, Conn., to Bethlehem Fabricators, Bethlehem, Pa.

350 tons, Central school, board of education, Margaretville, N. Y., to James McKinney & Son, Albany, N. Y.

300 tons, steel piling Tongue River, Oreg., lighthouse project, to Bethlehem Steel Co., Seattle.

285 tons, bridge, Dewitt and Goliad counties, Texas, to North Texas Iron & Steel Co., Fort Worth, Tex.

265 tons, warehouse extension, terminal building, Honolulu, to Honolulu Iron Works, that city.

260 tons, cellars, Standard Brewing Co., Cleveland, to Republic Structural Iron Works, Cleveland.

260 tons, state bridge, Benkelman, Nebr., to American Bridge Co., Pittsburgh.

250 tons, three bridges, Lane, Idaho, to Stupp Bros. Bridge & Iron Co., St. Louis.

235 tons, state highway bridge, Grand Junction, Colo., to Midwest Structural & Iron Works Co., Denver.

225 tons, bridge, Shetucket, Norwich, Conn., to American Bridge Co., Pittsburgh.

190 tons, seaplane ramp, North Beach airport, Long Island, to American Bridge Co., Pittsburgh.

190 tons, public school building, Roxbury, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.

175 tons, Cleveland Veterans hospital, to Lundoff-Bickneil Co., Cleveland.

175 tons, high school, Plum township, Pennsylvania, to Independent Steel Co., Pittsburgh.

170 tons, bridge, Borden county, Texas, to Central Texas Iron Works Co., Waco, Tex.

160 tons, addition, junior high school, Braddock, Pa., to American Bridge Co., Pittsburgh.

160 tons, bridge, Pomerang river, Southbury, Conn., to American Bridge Co., Pittsburgh.

145 tons, state bridge, Sandisfield, Mass., to Phoenix Bridge Co., Phoenixville, Pa.

135 tons, beams, plain and fabricated, Oconto, Wis., to Carnegie-Illinois Steel Corp., Pittsburgh.

125 tons, undercrossing, Klamath Falls, Oreg., to Poole & McGonigle, Portland, Oreg.; (Reported in Steel Dec. 26, as awarded to unnamed interest).

125 tons, bridge, Callahan county, Texas, to Central Texas Iron Works Co., Waco, Texas.

120 tons, grandstand, high school, Hazelton, Pa., to Pittsburgh-Des Moines Steel Co., Pittsburgh.

120 tons, Grant schools, Trenton, N. J., to Bethlehem Steel Co., Bethlehem, Pa.

110 tons, state underpass, Wolf Point, Mont., to American Bridge Co., Pittsburgh.

100 tons, Port of Seattle bulkhead improvement, to Bethlehem Steel Co., Seattle.

100 tons, bridge, Frio county, Texas, to Alamo Iron Works, San Antonio, Texas.

Unstated, two 110-foot roller gates for Roza dam, Yakima project, Washington

Shape Awards Compared

	Tons
Week ended Jan. 7	**42,858**
Week ended Dec. 31	**32,921**
Week ended Dec. 24	**35,067**
This week, 1938	**16,687**
Weekly average, year, 1938	**21,566**
Weekly average, 1939	**42,858**
Weekly average, December	**30,283**
Total to date, 1938	**16,687**
Total to date, 1939	**42,858**

Includes awards of 100 tons or more.

Behind the Scenes with STEEL

Xmas Jeer

■ Whitey Maurath's Xmas cover on the December 26 issue has provoked no end of comment and they tell us Whitey has had to hire three extra girls to help with all the fan mail. One of Whitey's more critical admirers ribbed him by asking: *If you're sharing the white and dark meat of life, why in the hell are you the only one at the table with anything on his plate?* Whitey sez he was caught by the camera just as he was serving his able secretary, Miss Yarans, and he also wants it known that that is the turkey gizzard and not his thumb in the gravy.

Late But Merry

■ Best after-Christmas greeting received this year came from John Coakley, adv. mgr., Thomas A. Edison, Inc. in the form of a press release telling of his woes and worries in getting out some appropriate cards. He was stumped for time and found himself Xmas morning completely mortified and cardless. And so, we'll help Mr. Coakley by wishing his friends, one and all, a belated but merry Xmas!

Mr. MacLeod Sits In

■ STEEL's Forum on Re-Employment continues this week with Norman D. MacLeod, president, Abrasive Machine Tool Co. Each week, this series of contributions has taken on more and more significance and has become, as one reader said last week, "the most constructive thought in any business paper all through this unemployment period."

Have A Secretary

■ Recently a Pittsburgh steelman became curious to know who was in charge of the Department of Agriculture when Henry Wallace was out plowing something or other under. So he dug into the situation and here's the answer: Under the Secretary of Agriculture is the Under Secretary. Next come the Assistant Secretary, three Assistants to the Secretary, the Private Secretary to the Secretary, the Assistant to the Under Secretary, the Secretary to the Under Secretary, the Assistant to the Assistant Secretary, the Secretary to the Assistant Secretary, and finally the Special Assistant to the Secretary. Reminds us of the story about the upper and lower berths. The upper, you know, is lower because it's higher, etc. etc.

Truth In Advertising

■ The Chicago *Daily News* carries a humorous yarn about Mark Twain being asked if he believed in truth in advertising, to which he replied: "That reminds me of an old fellow they tell of back home. He was reading a newspaper in an inn somewhere in the border country when he came upon a small advertisement which read: *Cut this out. It may save your life.* Obeying a strange impulse he did cut it out, and then, as he resumed reading he happened to look through the hole he had made. There he beheld a man stealing upon him with a knife. He thrust aside his paper and fetched his chair down upon his attacker. There was a patent medicine advertisement that really told the truth!"

Rings The Bell

■ Last week's Yearbook issue was apparently received with unanimous approval and we are busy reading such glowing tributes as "a very nice volume", "a work of art", "the best yet", "a masterpiece", and dozens of other ways of conveying the idea that STEEL once again has done a job. If you are thinking about any extra copies at $1.00 each, don't hesitate because there is just a handful left in stock.

—SHRDLU

state, to Treadwell Construction Co., Midland, Pa.

Shape Contracts Pending

3840 tons, units 3, 5, 9, Lake Washington bridge, Seattle; Puget Construction Co., Seattle, general contractor.
3000 tons, hospital, Richmond, Va.
2500 tons, apartment house, for J. J. & R. Greenberg Inc., Philadelphia.
1500 tons, municipal hospital, Jersey City, N. J.
1500 tons, music school building, Purdue university, West Lafayette, Ind.; bids Jan. 18.
1367 tons, unit 4, Lake Washington bridge, Seattle; Puget Sound Bridge & Dredging Co., Seattle, J. H. Pomeroy and Parker & Schram, Portland, general contractors.
800 tons, state grade crossing, Absecon, N. J.; bids Jan. 13.
712 tons, bridge, Wyandotte, Kans.; J. A. Tobin Construction Co., Kansas City, Mo., general contractors.
700 tons, Indiana state highway bridges; bids Jan. 10.
600 tons, hospital, Wilmington, Del.; bids postponed to Jan. 10.
500 tons, highway bridge, Queens, New York.
418 tons, piling, state bulkhead, Shark river, Monmouth county, New Jersey; bids Jan. 11.
365 tons, health center, Brooklyn, New York, for city.
350 tons, school building, board of education, Brighton, N. Y.
342 tons, highway bridge, Morton county, Kansas; Geiger & Weatherford, Leavenworth, Kans., general contractors.
310 tons, underpass, Clifton, N. J., for state.
300 tons, schools, Frederick, Md.; bids in.
300 tons, city hall, Youngstown, O.; bids in.
300 tons, women's dormitory, University of Minnesota, Minneapolis.
300 tons, building, Schaefer Brewing Co., Brooklyn, N. Y.
285 tons, underpass, Clifton, N. J.
250 tons, service building, F & R Lazarus & Co., Columbus, O.
235 tons, concessions buildings, Rockaway beach, New York, for city.
225 tons, state hospital buildings, Newberry, Mich.
200 tons, addition to Key bridge, Washington.
175 tons, retail market, New York, for city.
125 tons, store building, F. W. Woolworth & Co., Milwaukee; bids Jan. 4.
125 tons, approach to Main street bridge, Cleveland; Lombardo Bros., Cleveland, low.
100 tons, Fort Lewis, Wash., central heating plant; Walter S. Leland Co., Walnut Grove, Calif., general contractor.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 61

Completion of shipments against low-price orders for bolts and nuts finds the market substantially stronger. December deliveries were near the peak for the year, partly because of the movement of cut-price material, but prospects for renewed buying are favorable. Automotive needs are expected to be maintained, while railroad and farm equipment requirements are

counted on for expansion this quarter. Building construction also is a prominent outlet for bolts, nuts and rivets, largely because of the sizable amount of government-financed work under way. Some orders still are pending against shipbuilding contracts awarded last month.

Reinforcing

Reinforcing Bar Prices, Page 61

Pittsburgh — Reinforcing awards are still good and pending tonnage is fairly large, with a substantial number of projects 100 tons or more recently announced. The price situation has cleared considerably with published prices more closely adhered to. Government work still accounts for most tonnage now active.

Cleveland — Inquiries from private sources have failed to record material improvement. Fabricators are encouraged at the volume of public work scheduled to come up for bids during January. Outstanding recent award went to Lundoff-Bicknell Co., Cleveland, involving 500 tons, for the Cleveland Veterans hospital. Among the new projects not yet out for bids is the Gordon park development, WPA project, Cleveland, requiring 580 tons. Fabricated prices remain weak.

Chicago — Pending business is heavier, bolstered largely by PWA work for Illinois state institutions. Largest local tonnage pending is 2750 tons for the second section of the Chicago subway, for which general bids closed last week.

Philadelphia — New projects include 350 tons for a state grade crossing, Absecon, N. J., and 200 tons for a hospital, Wilmington, Del.

Seattle — Reinforcing contracts pending in the Pacific Northwest, to be placed within 30 days, aggregate more than 20,000 tons. The largest project is the Lake Washington pontoon bridge, involving more than 13,000 tons in eleven items, also 3200 tons for the Bonneville powerhouse, 1500 tons of rods and sheets for Tacoma's concrete water pipe, and 1000 tons for a 1200-man barracks at Fort Lewis. In addition bids are called for early January for more than 1500 tons for the Roza irrigation project and Washington state highway work.

Concrete Bars Compared

	Tons
Week ended Jan. 7	1,060
Week ended Dec. 31	5,153
Week ended Dec. 24	11,814
This week, 1938	6,005
Weekly average, year, 1938	6,959
Weekly average, 1939	1,060
Weekly average, December	8,973
Total to date, 1938	6,005
Total to date, 1939	1,060

Includes awards of 100 tons or more.

Reinforcing Steel Awards

500 tons, construction buildings and utilities, Veterans administration facility, Cleveland, to Lundoff-Bicknell Co., Cleveland.

200 tons, bridge over Ohio river, Owensboro, Ky., to Jones & Laughlin Steel Corp., Pittsburgh; Dravo Corp., Pittsburgh, contractor.

200 tons, girls' dormitory No. 2, Michigan State Normal college, Ypsilanti, Mich., to Truscon Steel Co., Youngstown, O.; O. W. Burke Co., Detroit, contractor.

160 tons, grade separation, outer drive, Wayne county, Ecorse, Mich., to Truscon Steel Co., Youngstown, O.; W. J. Storen Co., Detroit, contractor.

Reinforcing Steel Pending

8040 tons, unit 4, Lake Washington bridge, Seattle; Puget Sound Bridge & Dredging Co., Seattle; J. H. Pomeroy and Parker & Schram, Portland, general contractors.

1717 tons, unit 11, Lake Washington bridge, Seattle; Rumsey & Co., Seattle general contractors.

1500 tons, rods and sheets, 58-inch concrete pipeline for Tacoma, Wash.; American Concrete & Steel Pipe Co., Tacoma, general contractor.

1000 tons, 1200-man barracks, Fort Lewis, Wash.; Ross B. Hammond, Portland, general contractor.

"SMOOTHEST WIRE I EVER RAN"
"TOUGHEST WELD I EVER TRIED TO BUST"
"STANDS THE HEAT BETTER THAN ANY ROD I'VE USED"
"COLDEST-RUNNING ROD I EVER HAD"
"NEVER SAW A WIRE THAT WORKED AS GOOD EITHER A. C. OR D. C."
"IT GIVES ME MORE INCHES OF WELD PER WIRE"
"I NEVER BEFORE RAN AS SMOOTH A BEAD"

***Listen to what the welders say about* PAGE Hi-Tensile "G"**

Ask any welder who has run Page Hi-Tensile "G" what he thinks of the rod. He'll tell you it's remarkably fast, and gives a bead of surprising smoothness and unusually high ductility. He'll tell you it's a very quiet rod, with little spatter. Whether he has used it on production work, maintenance work or construction work, he will have found it practical under all operating conditions.

Get in touch with your local Page distributor. He has information you should have about Hi-Tensile "G" and other Page welding electrodes.

BUY ACCO QUALITY *in Page Welding electrodes, Page Chain Link Fence, Tru-Lay Preformed Wire Rope, Reading-Pratt & Cady Valves, Campbell Abrasive Cutting Machines, American Chains (Welded and Weldless), and Wright Hoists.*

PAGE STEEL AND WIRE DIVISION
MONESSEN, PENNSYLVANIA

AMERICAN CHAIN & CABLE COMPANY, Inc.

AMERICAN CHAIN DIVISION • AMERICAN CABLE DIVISION • ANDREW C. CAMPBELL DIVISION • FORD CHAIN BLOCK DIVISION • HAZARD WIRE ROPE DIVISION • HIGHLAND IRON AND STEEL DIVISION • MANLEY MANUFACTURING DIVISION • OWEN SILENT SPRING COMPANY, INC. • PAGE STEEL AND WIRE DIVISION • READING-PRATT & CADY DIVISION • READING STEEL CASTING DIVISION • WRIGHT MANUFACTURING DIVISION • IN CANADA: DOMINION CHAIN COMPANY, LTD. • IN ENGLAND: BRITISH WIRE PRODUCTS, LTD. • THE PARSONS CHAIN COMPANY, LTD. • *In Business for Your Safety*

823 tons, unit 2, Lake Washington bridge, Seattle; Bates & Rogers, Chicago, general contractor.

700 tons, United States air corps barracks superstructure, Chanute field, Rantoul, Ill.; Lippmann Construction Co., Chicago, general contractor.

642 tons, unit I, Lake Washington bridge, Seattle; Daily Construction & Engineering Co., Seattle, general contractor.

600 tons, West senior high school, Rockford, Ill.

580 tons, Gordon park development, Cleveland.

543 tons, unit 5, Lake Washington bridge, Seattle; Puget Construction Co., Seattle, general contractor.

525 tons, high school, Steubenville, O.

466 tons, unit 3, Lake Washington bridge, Seattle; Puget Construction Co., Seattle, general contractor.

460 tons, unit 9, Lake Washington bridge, Seattle; Puget Construction Co., Seattle, general contractor.

400 tons, state capitol building, Olympia, Wash.; McDonald Construction Co., Tacoma, general contractor.

350 tons, state grade crossing, Absecon, N. J.; bids Jan. 13.

350 tons, state bulkhead, Shark river, Monmouth county, New Jersey; bids Jan. 11.

290 tons, Negley Run drainage basin, Pittsburgh.

275 tons, women's dormitory, Minneapolis.

275 tons, incinerator building, Wadsworth, Kans.

250 tons, Washington grade school, Madison, Wis.

200 tons, hospital, Wilmington, Del.; bids postponed to Jan. 10.

200 tons, final addition to east approach, Main street bridge, Cleveland; Lombardo Bros., Cleveland, low.

190 tons, Health service building, Billings, Mont.

150 tons, school, Billings, Mont.

150 tons, hospital, Marinette, Wis.

125 tons, bridge over Chickahoming river, Charles City, Va.

115 tons, sections 7B and 8A, Pennsylvania turnpike, Somerset county, Pennsylvania; Connell & Laub, Dayton, O., low bidder.

110 tons, abutments, West 3rd street bridge, Cleveland; bids soon.

Pig Iron

Pig Iron Prices, Page 62

Pittsburgh — Pig iron and coke markets have shown little change the past three weeks, with the year-end slump less severe than usual. Pig iron shipments declined moderately, but coke deliveries in December were the best of the year. Eighteen of the district's 50 blast furnaces are active, two less than the 1938 peak figure.

Cleveland — Releases increased sharply the past few days, reflecting curtailed shipments near the end of 1938. Most sellers anticipate a gain of about 15 per cent in January shipments over December. Automotive foundries remain the largest consumers of pig iron, though demand elsewhere has increased. Farm equipment builders are taking larger tonnages in preparation for a seasonal upturn in operations. Pig iron prices are firm.

Chicago — December pig iron shipments showed only a slight drop from November, while foundry operations were a trifle heavier. With consumers' stocks relatively light, a bulge in iron deliveries is expected early this quarter. A marked upturn in sales is not in immediate prospect, since some users still are covered on near future needs. December shipments of foundry coke were the best since last March.

New York — Certain larger consumers indicate they may close on requirements well into the future, apparently seeking protection against a rising market. Miscellaneous buying, however, is not expected to get under way until later this month.

Philadelphia — Pig iron demand shows signs of revival, although some consumers will not complete inventory-taking until mid-January Sellers look for substantial improvement in business this quarter.

Buffalo—Pig iron activity has recovered promptly with the turn of the year. Numerous buyers have re-entered the market, with prompt shipment requested. Foundry operations range from three to five days a week. Heating equipment manufacturers are resuming production of supplies to fill orders expected for various public projects. A pick-up in casting demand from railroad shops is encouraging melters.

Hanna Furnace Corp. has blown in its second stack, giving the district nine active furnaces out of 14 and the highest operating rate in more than a year.

Cincinnati — Demand has started to recover from effects of the holidays, and a gain in shipments for January as a whole is expected. Some new business is looked for, although some old contracts already have been rewritten for this quarter.

St. Louis — New buying continues light, but the melt is well sustained. Consumers generally are well covered on early needs, but increased specifications are looked for shortly and relatively heavy shipments are seen for January. December deliveries were about even with November despite a letdown late in the month.

Birmingham, Ala. — Pig iron producers report noticeable let-down in spot business since the beginning of the holiday season, but are quite cheerful as to prospects for early resumption. Some increase is noted in shipping instructions.

Toronto, Ont. — With the holiday season over, new interest again is appearing in pig iron. Inquiries are pending for first quarter delivery, and a number of melters already are covered. Canadian pig iron production the past two months averaged slightly under 50,000 tons, and the new year opened with five stacks blowing.

Scrap

Scrap Prices, Page 64

Pittsburgh — Prices are firm despite the absence of consumer buying here the past few weeks. Shipments of steelmaking grades to down-river interests have prevented accumulation of distress tonnage and help to sustain prices. Brokers are not anxious to sell, feeling a better market will accompany the anticipated rise in ingot production.

Cleveland — Iron and steel scrap transaction are few and small. Consumers, even those with small inventories, are in no hurry to re-enter the market, but are expected to resume purchasing this week in some instances. Quotations are unchanged here and in the valleys.

Railroad lists are uniformly small, with little heavy melting steel offered, mostly railroad specialties.

Chicago — Scrap prices continue at levels prevailing the past 30 days, with mills still out of the market and dealer-broker trading quiet. Quotations are entirely nominal on a number of grades, although No. 1 steel is strong at $13.50 to $14. Railroad lists are reported to have brought the equivalent of as high as $14.60 for this grade. Renewed demand from mills is looked for within the next few weeks.

Philadelphia — Scrap prices are unchanged following a reduction a week ago. Some strength is appearing despite poor domestic demand, as indicated by a sale of 100 tons of No. 1 heavy melting steel by a local navy yard at $14.85, and disposition of 4000 tons of bundles by Edward G. Budd Mfg. Co. at about $14, plant. The latter price was higher than the figure prevailing a month ago.

Buffalo — The market has a stronger undertone, aided by the lifting of an embargo on shipments of certain items by a leading consumer. Gradual improvement in steel and pig iron production also is a strengthening factor expected to be reflected in scrap trading. No. 1 heavy melting steel continues $13.75 to $14.25.

Detroit — Scrap is inactive, with prices ranging from firm to weak. One fairly large consumer is out of the market for the next two

months to reduce inventories. Bundles have had an unexplained flurry, but prices are unchanged pending a more accurate determination of this situation.

Cincinnati — Mills continue to operate on stocks or on scrap due against old contracts, but renewed buying is looked for later this month. Dealer accumulations are being held rather closely in anticipation of better demand this quarter, and distress offerings are absent.

St. Louis — Recent quiet in the market is expected to be relieved by the closing on several lots of heavy melting steel for which inquiries have been pending. Prices generally are steady, although some steel specialties are fractionally lower. Shipments from the country still are aided by favorable weather.

Birmingham, Ala. — Although quiet, scrap shows signs of a fairly active first quarter. Dealers expect some reaction later in the month. Supplies are not great, but ample for present needs.

Seattle—While Japanese credits are tight, exporters anticipate further exchange releases early this month. Oriental demand continues strong, shipments being restricted only by the amount of available funds. Local mills, with substantial contracts imminent, are expected to be active in the market in the near future. Prices consequently are strong, with tidewater stocks low and receipts restricted by unfavorable weather. No. 1 steel is firm at $14.

Toronto, Ont. — Business continues quiet as melters are in no hurry for delivery. Available supplies of heavy melting steel, cast grades and stove plate are limited, however, and dealers are not booking ahead. Shipments of steel scrap to Hamilton mills are expected to resume within the next two weeks.

Warehouse

Warehouse Prices, Page 63

Cleveland — Sales have increased so far this month, and some warehouses predict a gain of about 10 per cent in January shipments over December. Others feel this month may exceed November.

Chicago — The holiday lull was brief, recovery in sales appearing sooner than usual. While a steady trend is seen for the next week or two, improved demand subsequently is in prospect.

Philadelphia — While retarded at present by inventory-taking at various plants, warehouse demand this month is expected to surpass December business. Prices are unchanged.

Buffalo — Some distributors report a slight pickup in business, with further gains expected upon completion of inventory taking. Prices are steady.

Detroit — The outlook is improved, with several tool programs reported nearly ready to be placed, but business so far has recovered but little from effects of holiday suspensions.

Cincinnati — Warehouses are optimistic over the first quarter outlook, but the year-end lull has yet to give way to the anticipated upturn.

St. Louis — The holidays had less effect than usual on warehouse business, December sales being moderately ahead of November and a year ago. Demand is well diversified, with coal mine and oil field needs substantial.

Steel in Europe

Foreign Steel Prices, Page 63

London (*By Cable*) — British pig iron producers are receiving additional inquiries, the volume increasing gradually, especially for hematite. Two furnaces have been relighted in the Middlesbrough district. The steel market is quiet but producers of light steel, especially sheets, expect increased orders following the government lead in air defense shelters.

Continental markets find export trade quiet, with sheet demand strongest.

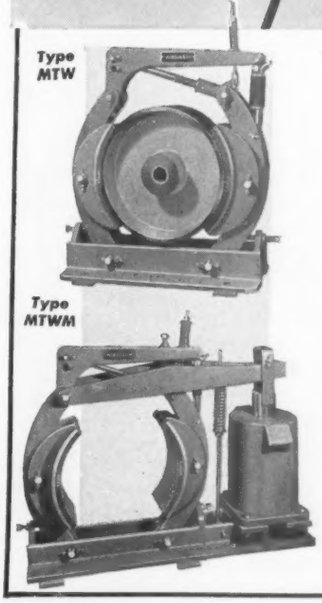
Continental Earns $2.18

■ Consolidated net income of $7,111,429 for Continental Can Co. Inc., after all charges, in the 12 months ended Oct. 31, 1938, was reported last week by O. C. Huffman, president. These earnings are equal, after provision for preferred dividends, to $2.18 a share on 2,853,971 shares of common stock.

Provision for federal, state and foreign income taxes, and surtax on undistributed profits amounted to $1,247,161 in the period.

■ The acting secretary of state has issued rules of procedure to govern licenses for tin-plate scrap exportation during 1939. Those wishing to export this material have been requested to make request for exportation permits with the secretary of state by Jan. 10.

Specify HYDRAULIC-ACTUATED
WAGNER INDUSTRIAL BRAKES
WHERE DEPENDABLE SERVICE IS Essential



Ruggedness characterizes every construction detail of Wagner Hydraulic-Actuated Industrial Brakes —Welded steel parts . . . Hardened pins and bushings . . . and Cannonite brake wheels, are just a few of their many advantages. They are built to "stand up" under the kind of service that usually "takes the life" out of ordinary brakes.

Type MTW is for ordinary bridge service, the type MTWM is equipped with spring-set shunt solenoid release to provide locking device where desired.

If you want low brake maintenance of Cranes, Coke Pushers, Transfer Cars and similar equipment—specify Wagner Brakes. Write today for complete information.

138-3A

WAGNER ELECTRIC CORPORATION
INDUSTRIAL BRAKE EQUIPMENT
4904 Baum Blvd. Pittsburgh, Pa.

Nonferrous Metals

New York — Nonferrous metals got off to a slow start as the new year opens but this had been expected and no appreciable weakness in the price structure developed last week. Quietness was attributed in part to uncertainties as to the legislative course likely to be taken by the new congress. The President's message as a whole was interpreted as being constructive and it was felt that congress is likely to be more conservative than it has been in the past few years.

Copper — Electrolytic continued to hold unusually steady on the London Metal Exchange while prices moved fractionally higher on the outside market to around 10.50c c.i.f. European ports. Sales averaged only a few hundred tons per day here but the stand was taken that a reduction in the domestic price level is not justified. Electrolytic held at 11.25c, Connecticut.

Lead — Buying tapered, reflecting the well-bought position of consumers. Prices held at 4.70c, East St. Louis, reflecting the well-sold position of producers and the balanced statistical position of the industry.

Zinc — No pressure to move metal was noted which may reflect the feeling on the part of some producers that London may advance sufficiently to permit a moderate rise here from the 4.50-cent East St. Louis level. New demand was only fair.

Tin—Prices fluctuated rather rapidly, due mostly to changes in the sterling exchange. Consumer purchases were negligible with Straits spot closing at 46.80c, or slightly above the previous week's close.

Antimony — Buying was dull with prices maintaining a firm front on the basis of 11.75c, New York, for American spot and nominally 14.00c, duty paid New York, for Chinese spot.

Steel Imports Light

Philadelphia—A shipment of 3169 tons of chrome ore arrived here from Cuba in the week ended Dec. 31; also 500 tons of ferromanganese from Czechoslovakia. Other arrivals included 74 tons of steel tubes, 27 tons of steel forgings, 16 tons of steel bars and 2 tons of wire rods from Sweden; 36 tons of steel bars, 16 tons of steel bands and 31 tons of structural shapes from Belgium; and 5 tons of shapes and 1 ton of bands from France.

Eagle-Picher Buys Lead, Zinc Properties

■ Eagle-Picher Mining & Smelting Co., controlled by Eagle-Picher Lead Co., has purchased the Commerce Mining & Royalty Co., which owned and operated extensive lead and zinc mines and mills. The Commerce company was reputed to be the largest single producing and operating concern in the tri-state field—Kansas, Oklahoma and Missouri.

Carl A. Geist, assistant treasurer of Eagle-Picher Lead Co., said there will be no new financing to pay the purchase price, reported to be about $10,000,000.

Broadened 1939 Market Seen for Aluminum

■ The aluminum industry entered 1939 with prospects for a wider market, according to George J. Stanley, vice president, Aluminum Co. of America. While 1938 sales were a little better than half those for 1937, increased consumption at year's end points to a decided upturn in 1939.

Aircraft construction, always an important outlet, faces a good year. Increases in aluminum consumption were also forecast in marine applications, railroad equipment, building trim and other applications.

Japanese Laboratory To Test Machine Tools

■ A government experiment station to test new machine tools for the nation's munitions and commercial industries will be opened near Tokyo, Japan, April 1, according to the department of commerce.

The commission on the machine tool manufacturing industry points out the number of shops engaged in the manufacture of heavy industry equipment has increased to more than 200 under the impetus of prevailing conditions and that it is necessary that rigid inspection be made of the products.

■ Bethlehem Steel Corp. through its subsidiaries, Bethlehem International Supply Co. and Bethlehem Supply Corp., expects to spend more than $600,000 in 1939 for modernization of the former International Supply Co. and Oklahoma Iron Works, recently purchased by Bethlehem.

Nonferrous Metal Prices

Spot unless otherwise specified. Cents per pound

Dec.	Copper Electro, del. Conn.	Copper Lake, del. Midwest	Copper Casting, refinery	Straits Tin, New York Spot	Straits Tin, New York Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 99%	Antimony Amer. Spot, N.Y.	Nickel Cathodes
30	11.25	11.37½	10.77½	46.65	46.75	4.85	4.70	4.50	20.00	11.75	35.00
31	11.25	11.37½	10.77½	46.65	46.75	4.85	4.70	4.50	20.00	11.75	35.00
Jan.											
3	11.25	11.37½	10.77½	46.40	46.55	4.85	4.70	4.50	20.00	11.75	35.00
4	11.25	11.37½	10.77½	46.50	46.65	4.85	4.70	4.50	20.00	11.75	35.00
5	11.25	11.37½	10.77½	46.55	46.70	4.85	4.70	4.50	20.00	11.75	35.00
6	11.25	11.37½	10.77½	46.80	46.95	4.85	4.70	4.50	20.00	11.75	35.00

MILL PRODUCTS

F.o.b. mill base, cents per lb. except as specified. Copper brass products based on 11.25c Conn. copper

Sheets

Yellow brass (high) 17.31
Copper, hot rolled 19.37½
Lead, cut to jobbers 8.00
Zinc, 100 lb. base 9.75

Tubes

High yellow brass 20.06
Seamless copper 19.87½

Rods

High yellow brass 12.62
Copper, hot rolled 15.87½

Anodes

Copper, untrimmed 16.62½

Wire

Yellow brass (high) 17.56

OLD METALS

Nom. Del. Buying Prices

No. 1 Composition Red Brass

New York 6.42½-6.55
Cleveland 6.75-7.00
Chicago 6.25-6.50
St. Louis 6.00-6.25

Heavy Copper and Wire

New York, No. 1 ..... 7.75-8.00
Cleveland, No. 1 ..... 7.75-8.00
Chicago, No. 1 ..... 7.87½-8.12½
St. Louis 7.50-7.75

Composition Brass Borings

New York 5.60-5.85

Light Copper

New York 6.25-6.50
Cleveland 5.75-6.00
Chicago 6.25-6.50
St. Louis 6.00-6.25

Light Brass

Cleveland 3.50-3.75
Chicago 4.00-4.25
St. Louis 3.50-3.75

Lead

New York 4.00-4.25
Cleveland 3.50-3.75
Chicago 3.75-4.00
St. Louis 3.50-3.75

Zinc

New York 2.50-2.62½
Cleveland 2.00-2.25
St. Louis 2.25-2.50

Aluminum

Borings, Cleveland 5.75-6.00
Mixed, cast, Cleveland 6.75-7.00
Clips, soft, Cleveland 13.75-14.00
Mixed cast, St. Louis 7.00-7.50

SECONDARY METALS

Brass ingot, 85-5-5-5, less carloads 11.00
Standard No. 12 aluminum ... 13.25-13.75

Activities of Steel Users, Makers

■ REPUBLIC Steel Corp., Cleveland, has combined its building products co-ordination department and the sales promotion division of the product development department into the sales development and co-ordination division of general sales. F. A. Kelly, who has been head of the building products co-ordination department, has been named manager of the new division, and F. H. Ramage, formerly head of the sales promotion division, has been named assistant manager.

♦

Bethlehem Steel Co. has obtained a license to make lead-bearing steels under Inland Steel Co. patents.

♦

Pennsylvania Wood & Iron Co., Buffalo, has moved its offices to 892-894 Ellicott Square building.

♦

Fostoria Pressed Steel Corp., Fostoria, O., held open house at its plant Dec. 27, as a feature of the sales promotion conference in progress during that week.

♦

Kisco Boiler & Engineering Co., St. Louis, is now operating in its new 3-story plant at 3732-40 Chouteau avenue. The firm formerly was located at 4333 Duncan avenue and 4414-18 West Papin street.

♦

Allen-Bradley Co., Milwaukee, manufacturer of electric motor controls, has opened a sales office at 101 Broadway, Rockford, Ill., with H. L. O'Donnell, formerly of the Chicago office, in charge.

♦

Hydraulic Press Mfg. Co., Mount Gilead, O., builder of patented H-P-M Hydro-Power Fastraverse presses, has licensed Birdsboro Foundry & Machinery Co., Birdsboro, Pa., to use its system in three presses for foreign shipment.

♦

Allis-Chalmers Mfg. Co., Milwaukee, opened a new branch office and warehouse at 1060 Broad street, Newark, N. J., Jan. 1, in charge of C. A. Pihl, manager. The new office will be a branch of and under the jurisdiction of the New York district office.

♦

Sterling Electric Motors Inc., Los Angeles, has opened direct factory offices temporarily at 81 San Miguel street, Springfield, Mass., to care for eastern business. Allen A. Adams, treasurer and director of the company, will serve as eastern manager.

♦

Sprout, Waldron & Co. Inc., Muncie, Pa., has appointed Chase, Parker & Co. Inc., Boston, distributor of its complete line of power transmission appliances in the states of Maine, New Hampshire and in nine counties of Massachusetts.

♦

Harnischfeger Corp., Milwaukee, has appointed Butte Tractor & Equipment Co., Redding, Calif., exclusive agent for its line of arc welders and welding electrodes. The Butte company will operate under the supervision of Harnischfeger's San Francisco office.

♦

A. W. Cadman Mfg. Co., 2816 Smallman street, Pittsburgh, has been licensed to founder Cupaloy by the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., and will offer the new copper alloy in cast shapes. The Cadman company operates a nonferrous foundry established in 1860.

♦

Industrial division, Ransome Concrete Machinery Co., Dunellen, N. J., builder of adjustable welding work tables and positioners, has appointed Machinery & Welder Corp., St. Louis, exclusive representative in Illinois, Missouri, Kansas, Iowa, Wisconsin, Michigan and parts of Indiana.

♦

"Elastuf Group of Related Machinery Steels," developed by the Horace T. Potts Co., Philadelphia, and formerly distributed entirely through Potts warehouses in Philadelphia and Baltimore, and through Brown-Wales Co. in Boston, can now be obtained also in the Buffalo and New Orleans warehouse areas through Beals, McCarthy & Rogers Co., and Equitable Equipment Co., respectively.

♦

Establishment of an industrial fellowship in Mellon institute, Pittsburgh, by the United States Gypsum Co., Chicago, is announced by Dr. Edward R. Weidlein, director of the institute. Dr. H. E. Simpson, a member of Mellon institute since 1936, has been appointed to the incumbency of the fellowship, to conduct fundamental research on various products manufactured by the Gypsum company, with the objective of developing new processes and technics which will have broad application in the field of building materials. This investigational work will augment the regular research activities carried on by the donor.

Mineral Control World Peace Key

■ DRIVE for redistribution of the world's natural wealth will fail, declared Charles K. Leith, department of geology, Wisconsin university, addressing the semicentennial meeting of the Geological Society of America at New York, Dec. 30.

"Ultimate control will remain where it is and might will continue to make right," he said. "Control of the mineral part of our environment is centered around the North Atlantic basin, where the industrial revolution started. The United States and Great Britain control nearly 75 per cent of the world's total. Mineral supplies of France and Russia are minor in comparison, though more or less adequate for these countries."

Germany is dependent on foreign countries for at least 60 per cent of her iron ore supply. Italy's production of domestic iron ore is only about 20 per cent of her consumption and Japan mines within her own territory only 35 per cent of the ore necessary to meet her steel requirements, according to statistics cited by Prof. Leith. Germany produces only 14 per cent of her copper needs and 40 per cent of necessary manganese.

"Have Nots" Campaign Failing

Increasing co-operation of the "have not" nations will bring greater unity between the United States and Great Britain, he said. Challenge of the "have nots" is shown first in the effort to find and develop domestic supplies and processes to make low-grade ores available. This has gone far enough to demonstrate its essential futility. The inevitable consequence is pressure for control of more supplies outside, through acquisition of more territory.

Efforts of Germany, Italy and Japan to make themselves self-sufficient are not only unsuccessful but are creating exchange difficulties which are cutting them off from outside supplies essential to their present industrial activity.

"Necessity of protecting democratic institutions will stiffen the defense of the material position of the United States," he said. "The defense will include not only resistance to acquisition of more territory but, perhaps of greater importance, building of greater resistance to commercial control through trade and barter. Our counter thus far is extension of reciprocal trade treaties but for the present this method is not proving effective in

holding our position. The frontiers of our mineral industries, both raw materials and markets, extend to nearly all parts of the world. It is part of our domain that is ultimately at stake. Isolation would mean going back to the horse and buggy age.

"The problem will grow steadily more acute until the ultimate question of world control of raw materials is settled. This requires vast planning and research, which now is hardly started, and should receive more attention from groups interested in world peace."

Farm Electrification In Metals, Equipment

(*Concluded from Page* 14)

panies, equipment builders and government agencies are educating farmers to electricity, and developing new uses. It is said to be only a matter of time until electric power is applied to field operations such as plowing and cultivating.

Recent gains in installation of water systems may be largely attributed to rapid extension of rural electric service. Domestic shipments of such equipment, generally for farm use, reached a new high of 13,934 units last October, according to the census bureau. This compared with 12,144 units in the same month, 1937.

Although the electrification program produces considerable buying of heavy substation equipment, this is not so true of generating machinery. Utilities generally are able to use excess capacity in rural areas, while the co-operatives buy TVA, municipal or private company power, only a few building new plants.

Line Building May Decline

Despite the great number of farms yet to be served, annual totals of lines built probably will begin to decline within several years, since best sections have already been reached. However, it is not anticipated this will depress equipment sales because increased power application per farm should show compensating effects.

The danger of constructing lines prematurely, in advance of farmers' willingness or ability to share in cost, is indicated by 300,000 farms which are located on existing lines and do not subscribe to service. In view of the 1,500,000 users this means that one farm in six does not take advantage of available electricity.

Admittedly, REA and public utilities consider both the social and economic factors in extending rural service. Nonetheless, there is necessity to restrict line building to districts which can support it, else creation of "white elephant" areas will weaken the movement's financial stability.

Credit is due General Electric Co. and Westinghouse Electric & Mfg. Co., for some factual details in this article concerning electrical equipment requirements incident to rural electrification.

Equipment

Seattle—Electrical equipment and machinery for public works projects continue active. Pending purchases by the Bonneville administration include trucks and tractors, while Northwest Engineering Co. is low for two dragline excavators for the Deschutes and Columbia Basin projects.

Chicago — Machine tool sellers report a quiet week, although several lists are actively pending, having been held over from late December. Volume of inquiries is on a par with the influx of last week, continuing rather scant. Within the next two weeks, selling interests anticipate a measure of improvement, as several sizable orders are reported to be in the immediate offing.

Construction and Enterprise

New York

LIVERPOOL, N. Y.—Air Cooled Motors Corp. has plans underway for construction of an addition to its plant at cost of $40,000 with equipment. Project to mature soon. M. E. Granger, Syracuse, N. Y., consulting engineer.

MORRISTOWN, N. Y.—Morristown Sulphite Mill proposes to construct a plant addition at estimated cost of $40,000. Will mature this year.

OSWEGO, N. Y.—Central New York Power Corp., 300 Erie boulevard, Syracuse, N. Y., has awarded general contract for construction of a steam-electric generating plant costing an estimated total of $9,500,000 to Stone & Webster Engineering Corp., 90 Broad street, New York. (Noted Oct. 10.)

ROCHESTER, N. Y.—Lindhay Browne Associates Inc. has been organized with capital of $20,000 to deal in machinery and tools. Hubbell, Taylor, Goodwin, Nixon & Hargrave, 31 Exchange street, Rochester, N. Y., representatives.

Connecticut

OAKVILLE, CONN. — Autotyre Co., plans to build a one-story, 61 x 200-foot brick and steel warehouse which will include travelling cranes and boiler plant. Cost more than $40,000. Engineer, Fletcher-Thompson Inc., Bridgeport, Conn.

Massachusetts

EVERETT, MASS.—Monsanto Chemical Co. plans to construct a two-story brick and steel manufacturing plant costing about $50,000 with equipment. W. Flaws, Everett, consultant.

WORCESTER, MASS.—Worcester Wire Works has awarded general contract for a $40,000 one-story, 35 x 155-foot factory addition to Fiske-Carter Construction Co., 8 Norwich street.

New Jersey

WOODLYNNE, N. J.—Borough has PWA grant in the projected construction of a sewage disposal plant and sanitary sewers to cost approximately $32,000. Perring & Remington Co., Camden, N. J., consulting engineer.

Pennsylvania

ERIE, PA.—City, J. S. Dunwoody, superintendent of water bureau, is preparing plans for early maturity of a project involving extensive waterworks improvements.

OIL CITY, PA.—Pennsylvania railroad plans to spend more than $200,000 to rebuild a roundhouse and machine shop destroyed recently by fire. F. D. Davis is general superintendent of the road's Buffalo-Pittsburgh division.

READING, PA. — Birdsboro Steel Foundry & Machine Co. has awarded contract to C. T. Painter, Reading, for alterations and improvements in its foundry at estimated cost of $40,000.

Ohio

MILLERSBURG, O.—Holmes Rural Electric Co-operative Inc., George Hefferline, superintendent, takes bids due Jan. 12 on construction of 121 miles of rural electric lines costing approximately $139,000. Gibbs & Hill, New York, engineers. (Noted Nov. 7.)

RAWSON, O.—Village, Jacob Romick, mayor, has approved bond issue and is completing plans to construct waterworks costing $59,000 and including pumping and distribution systems. Consulting engineer, Russell Mason, Findlay, O.

WAUSEON, O.—City, Herbert Demaline, mayor, will complete plans late this month for construction of sewers and sewage treatment plant costing $80,000. Plant includes chemical precipitation, sludge digestion and trickling filter systems. Champe, Finkbeiner & Associates, Toledo, O., consultants.

Michigan

PONTIAC, MICH.—City, W. P. Edmundson, manager, is taking bids due at 1 p.m., Jan. 24, on contract No. 2 in sewage system improvements; work involved consists of aeration units, digestion tank and appurtenances. H. P. Jones Engineering Co., Toledo, O., consulting engineer. (Noted Nov. 7.)

Illinois

CHICAGO—Industrial Machinery Corp. has been incorporated with $25,000 capital to deal in machinery and industrial equipment. Correspondent, Edward Biggs, 69 West Washington street.

CHICAGO—Major Tool Co. has been incorporated to deal in tool supplies. Ewart Harris, 139 North Clark street, correspondent.

Indiana

MARION, IND.—City, Roy Tippery, clerk, will take bids about March 1 on contracts in construction of sewage

treatment plant and intercepting sewers costing total of $600,000. Consulting engineers, Consoer, Townsend & Quinlan, Chicago.

Alabama

TROY, ALA.—South Alabama Electric Membership Corp., J. H. Schuessler, superintendent, takes bids soon on 265 miles of rural power lines in four counties. REA has allotted $239,000 loan.

Maryland

HAGERSTOWN, MD.—City, F. R. Crowther, clerk, receives bids Jan. 12 on contract No. 2-F of sewage works improvement program; includes sludge tanks, bar screen, pumps, chlorinator and gas engine equipment.

District of Columbia

WASHINGTON — Navy department, yards and docks, has awarded $1,219,000 contract to American Bridge Co., Pittsburgh, for two 350-ton cranes to be installed in navy yards at Brooklyn, N. Y., and Norfolk, Va. Specification 8979.

Kentucky

FT. THOMAS, KY.—City, Theodore Kleumper, manager, is completing drawings and will be ready for bids in several days on construction of a pumphouse and installation of pumps and meters at total cost of $43,911. Consulting engineer, J. S. Watkins, Lexington, Ky.

McKEE, KY.—Jackson County Rural Electric Co-operative Corp., C. Reynelds, superintendent, takes bids soon on construction of rural power transmission lines for which it has received REA allotment of $188,000.

Florida

LAKELAND, FLA.—PWA has allotted grant of $167,000 to city in the projected construction of water and power system improvements to cost an estimated $371,000. (Noted Nov. 28.)

Georgia

ATLANTA, GA.—National Battery Co., A. H. Baggett, president, 2315 Pine street, St. Louis, plans to begin construction soon on a one-acre site of a $200,000 manufacturing plant. Ultimate capacity to be 1500 batteries daily.

Mississippi

HOLLANDALE, MISS.—Twin County Electric Power association has $170,000 REA allotment and will soon take bids on 186 miles of rural electric lines in four counties.

North Carolina

CLIFFSIDE, N. C.—Duke Power Co., 430 South Church street, Charlotte, N. C., has site selected for construction of a contemplated two-unit steam power plant costing $7,500,000. Will also build 40-house village for employes. Work to begin soon.

GREENSBORO, N. C.—Monarch Elevator & Machine Co., Fred C. Carlson, representative, 431 Morehead avenue, has preliminary plans for construction of a plant.

Missouri

MACON, MO.—City, Dr. Charles Shale, mayor, has received PWA grant of $58,514 for power plant construction program and $29,244 for waterworks; $110,000 bond issue has also been voted. Baumes Engineering Co., Railway Exchange building, consultant.

MT. VERNON, MO.—REA has approved $263,000 allotment to Ozark Electric co-operative, W. L. Boucher, superintendent, to finance construction of 245 miles rural transmission lines in six counties. Sverdrup & Parcel, Railway Exchange building, St. Louis, consulting engineers.

ST. LOUIS—John C. Kupferle Foundry Co. is receiving bids on construction of a one-story, 46 x 57-foot addition to its foundry.

Oklahoma

VINITA, OKLA.—Grand river dam authority proposes to build several 66-kilovolt amperes transmission lines from the dam at cost of about $750,000. Holway & Neuffer, Tulsa, Okla., consulting engineers in project.

Wisconsin

CHIPPEWA FALLS, WIS.—Wisconsin Power co-operative, E. B. Wayts, superintendent, will take bids soon on construction of a new unit in its generating plant. REA has allotted $200,000 on work.

Texas

GALVESTON, TEX.—City has PWA funds and will soon take bids on proposed pumping plant improvements costing approximately $55,000 at Alta Loma water supply. Freese & Nichols, Capps building, Ft. Worth, Tex., consulting engineers. (Noted Dec. 26.)

HARGIL, TEX.—Dodds & Wedegartner, San Benito, Tex., are building a pipe manufacturing plant at approximate cost of $60,000 with equipment.

SAN ANTONIO, TEX.—Construction quartermaster, Ft. Sam Houston, takes bids in February on construction of fireproof hangar, engineering shop, parachute room and machine shop costing total of about $250,000 with equipment.

VICTORIA, TEX.—REA has allotted $125,000 to Victoria County Rural Electrification Co-operative Inc. for construction of power transmitting lines serving 300 customers in the county.

Kansas

OSAWATOMIE, KANS.—City, H. E. Newhouse, mayor, is revising plans and will take new bids about Jan. 15 on construction of a waterworks and power plant to cost about $200,000. Burns & McDonnell Engineering Co., Kansas City, Mo., consulting engineer.

Nebraska

AURORA, NEBR.—Hamilton County Rural Public Power district, Thomas Williamson, president, takes bids to 10 a.m., Jan. 20, on construction of 204 miles rural power transmitting lines in three counties. REA has allotted $216,000. Bid bond or certified check 5 per cent to accompany bid. H. H. Henningsen Engineering Co., Omaha, Nebr., consulting engineer. (Noted Nov. 21.)

EMERSON, NEBR.—Northeast Nebraska Rural Public Power district has $206,000 REA allotment for construction of rural electric lines totaling 286 miles.

SEWARD, NEBR.—REA has allotted $274,000 to the Seward County Rural Public Power district, L. D. Geis, president, for construction of 228 miles of rural electric lines in three counties.

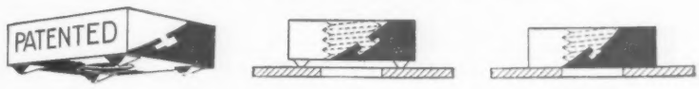
WOOD RIVER, NEBR.—Hall County Rural Public Power district, Charles Miller, president, has received an allotment of $164,000 REA funds to finance construction of 121 miles transmission lines.

YORK, NEBR.—REA has approved a $271,000 allotment to the York County Rural Public Power district to finance construction of 237 miles transmitting lines. H. H. Henningsen Engineering Co., Omaha, Nebr., consultant.

Iowa

ALLISON, IOWA—REA has approved $126,000 allotment to Green County Rural Electric co-operative to finance

OHIO WELDING NUTS



OHIO WELDING BOLTS

If you use resistance welding, investigate the savings and improved design made possible by Ohio Welding Nuts and Bolts

For information and samples, write to

THE OHIO BOLT & NUT COMPANY

610 Front Street, Berea, Ohio

construction of 112 miles rural lines.

BANCROFT, IOWA—City submits to voters Jan. 12 proposal to construct a municipal light plant costing $100,000. Leo Saunders, city clerk.

DAYTON, IOWA—Village, George Tarrant, clerk, takes bids to 1 p.m., Jan. 23, for installing equipment necessary in projected shift from 25-cycle to 60-cycle motors in power plant. Ralph Gearhart, Cedar Rapids, Iowa, consulting engineer.

DES MOINES, IOWA—City, John McVicar, superintendent of public improvements, has received PWA grant in the proposed construction of a complete sewage treatment plant to cost $188,000. John Tippee, city engineer.

HARLAN, IOWA—City, light plant board of trustees, Leo Billings, secretary, will accept bids to 7:30 p.m., Jan. 19, on 2 or 4 cycle diesel engine of about 2000 brake horsepower, electric generator, exciter and miscellaneous equipment. Certified check $2000 to accompany bid. (Noted Dec. 26.)

MUSCATINE, IOWA—PWA has approved grant to the city in the improvement of its electric plant at cost of $500,000. Wilbur Thorsen is plant manager. Young & Stanley, Muscatine, consulting engineers.

OTTUMWA, IOWA—PWA has approved a grant to city to aid in financing construction of a sewage treatment plant estimated to cost $1,172,515. H. E. Cook, city engineer. (Noted Oct. 17.)

Idaho

FILER, IDAHO—City has plans in progress for construction of a sewage disposal plant and sewerage system at cost of $75,000. H. W. Merritt, Twin Falls, Idaho, engineer.

Pacific Coast

BAKERSFIELD, CALIF. — California Water Service Co. plans to spend $200,000 during this year on construction of wells, pumping plants, booster station, storage tanks and mains.

HOLLYWOOD, CALIF.—Certificate to conduct manufacturing and machine shop business under the firm name of A. J. Swanson Co., at 1526 North Ivar avenue, has been issued to owner Alfred Swanson.

LOS ANGELES—Certificate to conduct a machine shop business under name of Grow Mfg. Co., 226 Lakeshore Terrace, has been issued to owner Frank Grow.

LOS ANGELES—Certificate to engage in business under firm name of Dependable Sheet Metal & Iron Works at 3032 South Main street, has been issued to owners Benjamin Hein and Charles Davidian.

LOS ANGELES—Certificate to conduct business as Electric Tool & Supply Co. at 2150 Santa Fe avenue, has been issued to A. R. Williams, Inglewood, Calif., and Frank Lloyd, Los Angeles.

PICO, CALIF.—Worley & Co., manufacturers of metal lockers, shelving and steel products, are preparing plans for construction of a 60 x 160-foot steel factory building.

SACRAMENTO, CALIF.—Bureau of reclamation, Washington, takes bids to Jan. 19 on manufacture and installation of four 75,000-kilowatt generators to be installed in hydroelectric plant at Shasta dam. Each to be direct-connected by a vertical shaft to a 103,000-horsepower turbine which will be bought under separate contract.

SAN FRANCISCO—Twelfth naval district, Federal building, will take bids on boilers, settings, preheating equipment, draft fans and oil burners for installation at Pearl Harbor, T. H. Specification 9074.

Canada

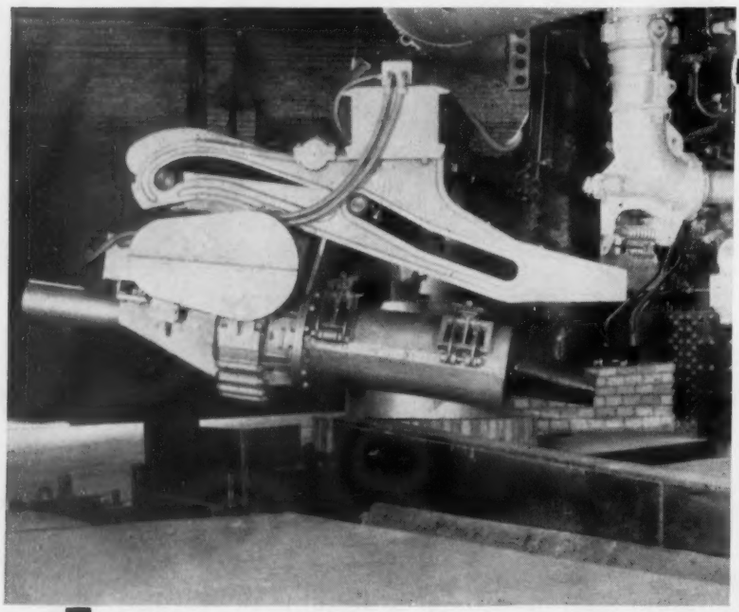
BRANTFORD, ONT.—Onondaga Refiners, N. MacDonald, manager, has purchased a power house, will alter it and install equipment for oil refinery use at cost of about $25,000.

COBOURG, ONT.—Aluminum Co. of Canada Ltd., 1010 Ste. Catherine street, Montreal, O. M. Montgomery, general manager, proposes to construct a plant costing approximately $150,000.

SHERBROOKE, QUE. — Superheater Co. Ltd., 7 Drummond street, G. Thompson, manager, plans to construct an addition to its factory at cost of about $75,000.

PRINCE ALBERT, SASK.—City is contemplating purchase of centrifugal motor-driven pump and four filters and construction of sedimentation basin and mains at cost of $75,000. J. Johnson, city engineer, in charge of plans.

REGINA, SASK.—Saskatchewan power commission, L. A. Thornton, commissioner, proposes to install a turbo-generator in local plant at cost of $75,000.



Furnace Men!

TAPPING HOLE TROUBLE DISAPPEARS

A STRONG FRONT IS SECURED

NO NEED TO BLANK TUYERES

NO DELAYS AT CASTING TIME

NO INTERRUPTION TO STEADY STOCK DESCENT

NO VARIATION IN POSITION OF TAPPING HOLE

LONGEST LIFE AND LEAST MAINTENANCE

BRASSERT THREE-MOTOR TAPPING HOLE GUN

write for bulletin to

H. A. BRASSERT & COMPANY 310 So. Michigan Avenue CHICAGO

READER Comments

Readers are invited to comment upon articles, editorials, reports, prices or other editorial material appearing in STEEL. The editors cannot publish unsigned communications, but at their discretion may permit a writer to use a pseudonym when a bona fide reason exists for withholding his identity. Letters should be brief—preferably not exceeding 250 words.

High Taxes Penalize Labor

To the Editor:

The editorial in STEEL, Jan. 2, page 222, is most interesting and the elections of last year point out that either these new laws or the administration of them are not satisfying our people as a whole. This may have some effect on congress and the administration at Washington, not because they wish to do better, but merely because they might lose their jobs with the voters changing their minds from that of 1932 to 1936.

A most important phase of these high taxes is that when the federal government takes our cash by way of income taxes it is impossible to make needed plant extensions, additions and improvements. Our business is not large, of course, but the many thousand of manufacturing units such as ours do make an aggregate of some proportion.

But for the taxes the writer paid in 1937 we could now install four new turret lathes which are badly needed, with additional plant space and office room. Because of this taking of our cash we are not making these installations because we cannot pay out our cash and run our business or make extensions on credit in these precarious times, even though the federal government might expect business to do so.

If the above four new machine tools were installed it would mean furnishing approximately 15,000 hours of machine tool work for additional employes in 1939, and, in addition, we would purchase for these tools alone many hundreds of tons of steel.

We tell our employes, and truthfully, that but for taxes, we could raise every man's wages $50 per month.

HARRY PENNINGTON

President,
Pennington Signaling Core Barrel,
San Antonio, Tex.

Forum Is Constructive

To the Editor:

Congratulations on the "Forum on Re-employment" feature. That is one of the most constructive thoughts I have seen in any business paper all through this unemployment period.

I thought Mr. Whipp's lead-off article was a dandy because he made a direct attack on the real problem and offered some sensible and practical suggestions for correction.

When business men stop wasting their energy criticising Washington, (not that it doesn't need it), and do more real constructive planning similar to Mr. Whipp's thinking, then there will be real hope for us getting somewhere. Furthermore, it appears that business, under existing conditions, is too profit-minded. What if it is necessary to operate a year or two without tangible profit if by doing so the unemployment problem would be brought under control? Then profits can be re-established. I appreciate that this has its limitations, but so long as the unemployment problem is with us it must be paid for and it seems to me that it would be much more constructive for business to pay for it in connection with productive efforts in its own plants.

Whether we like it or not, the business game must be played under new rules and there will be no victory achieved by sitting on the side lines and grumbling. It is a real test of business' resourcefulness and some are doing a wonderful job of demonstrating their abilities.

I am looking forward to future issues of your re-employment forum. The message, "Trundle Talks with Santa Claus," a booklet published by George T. Trundle Jr., president, the Trundle Engineering Co., Cleveland, would have been a timely one for you.

RALPH O. MCGRAW

Industrial Marketing,
Chicago.

STEEL'S Yearbook Pleases

To the Editor:

Your 1939 Yearbook of Industry has just reached me. It is a very nice volume and we will see that it is placed in the proper hands for reading purposes.

H. L. BRAINERD

Vice President and General Manager,
Brainerd Mfg. Co.,
East Rochester, N. Y.

To the Editor:

We have just received STEEL'S 1939 Yearbook of Industry and it is, indeed, a work of art, to say nothing of the useful information contained in it.

A. H. CURTISS

Secretary and Treasurer,
Conneaut Can Co.,
Conneaut, O.

THERE'S A "PLUS" FOR YOU IN WEIRITE

For more than three decades, Weirton has been producing tin plate of strictly controlled quality . . . tin plate dependably uniform in gauge, ductility and coating . . . tin plate embodying the full craft of skilled steelmakers aided by the most modern equipment. As a result, WEIRITE Tin Plate today brings to you a "plus" factor in quality that adds to your business through its efficiency in your operations. This plus factor maintains Weirton as the world's largest independent tin plate producer.

WEIRTON STEEL COMPANY · WEIRTON, W. VA.

DISTRICT SALES OFFICES: *Boston*, 1001 Statler Building; *Chicago*, 228 North LaSalle Street; *Cincinnati*, 2606 Carew Tower; *Cleveland*, 1217 Leader Building; *Detroit*, 11-210 General Motors Building; *Indianapolis*, Chamber of Commerce Building; *New York*, 405 Lexington Avenue; *Philadelphia*, 1462 Broad Street Station Building; *Pittsburgh*, 2800 Grant Building; *Rochester*, 45 Exchange Street; *St. Louis*, Cotton Belt Building; *San Francisco*, Sharon Building; *Toronto, Ontario*, General Assurance Building, 357 Bay Street.

DIVISION OF
NATIONAL STEEL CORPORATION

NATIONAL · STEEL ·